



Community-Centered Optimization of Nature-Based BMPs Starting with the Gaffey Nature Center Facility

Scientific Studies Program

Fiscal Year 2022-2023

All Watersheds

SEITec

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Study Overview

Biofiltration BMP Optimization

This study aims to optimize:

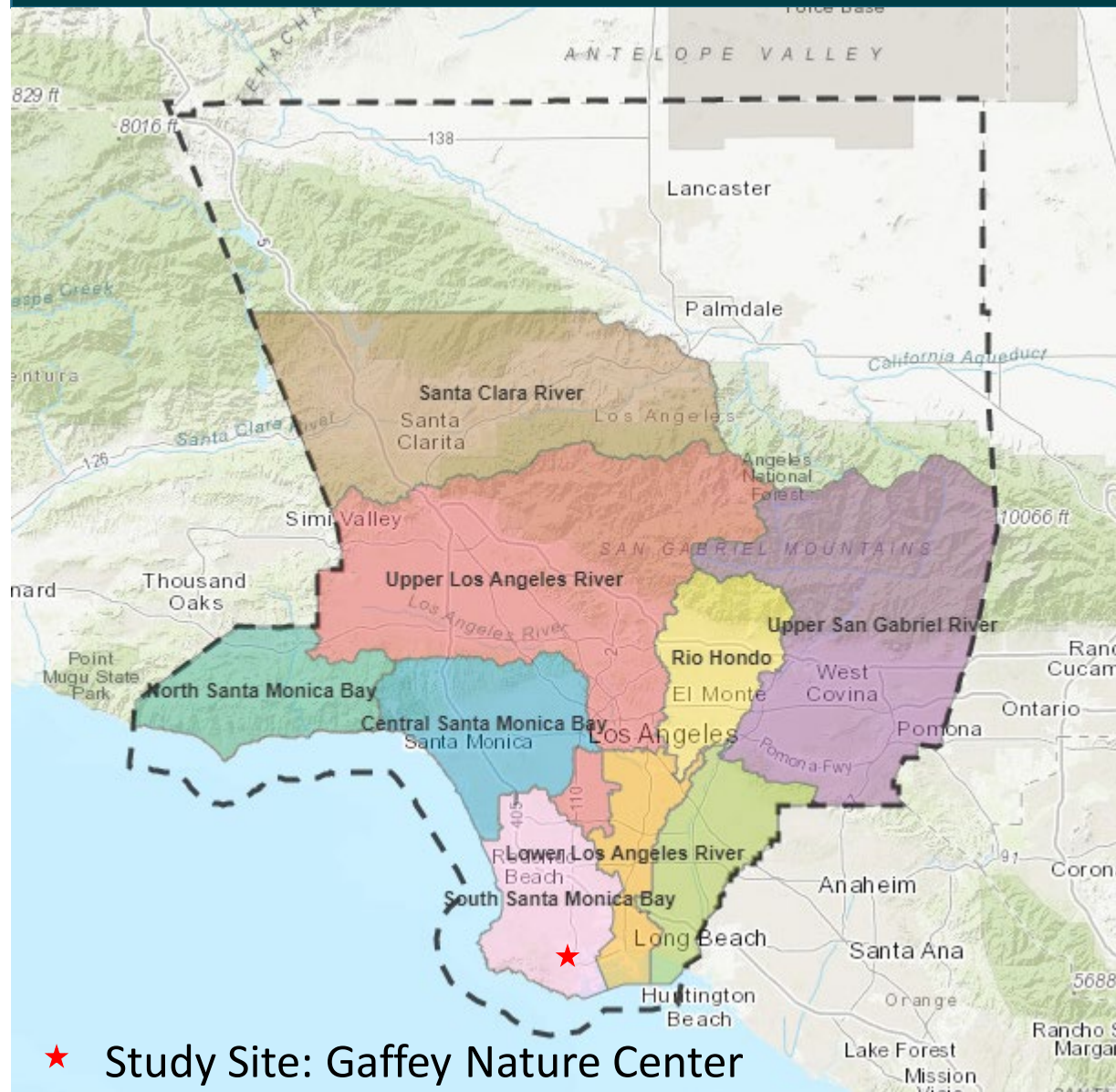
1. plant varieties and species, and
2. the design, construction, and O&M of

nature-based biofiltration BMPs, with special focus on the community.





Study Location



Study Location: The “Gaffey Nature Center” in San Pedro, a purposely built facility to study nature-based stormwater BMPs.

Study Benefits: This study will benefit the implementation of nature-based stormwater BMPs in **ALL watersheds.**



Study Location – The Gaffey Nature Center

- 3.1-acre site at N. Gaffey St. and 110-FWY in San Pedro, CA
- Land leased to LASAN for BMP education and research
- Construction work completed in September 2021

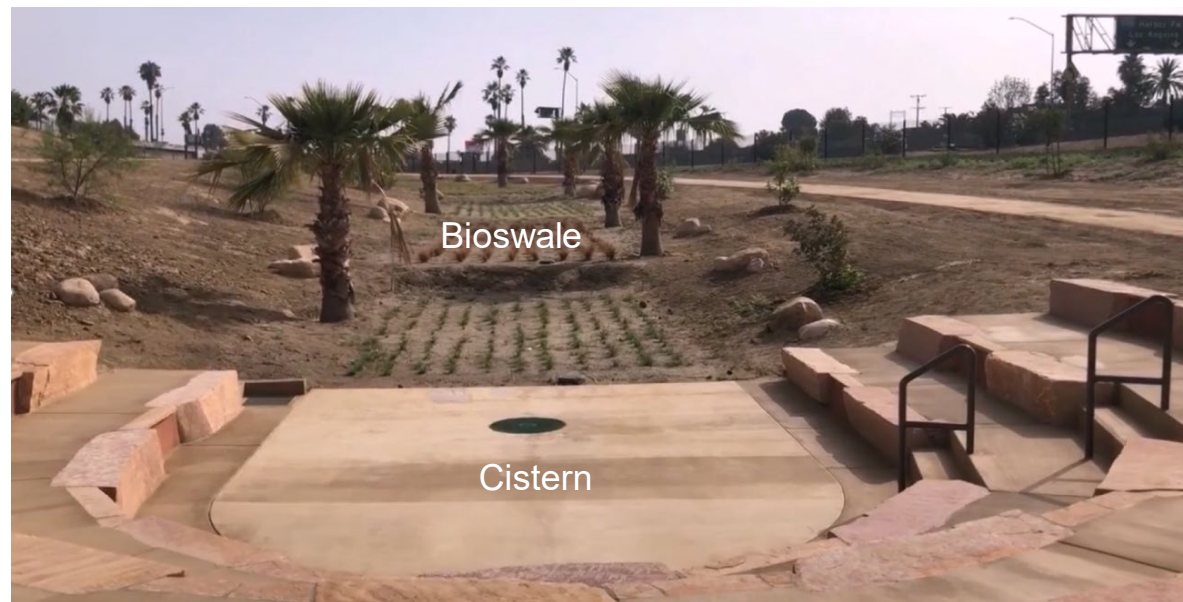




The Gaffey Nature Center

Site incorporates

- City's first vertical cistern, now in several SCW projects
- Central hydroponic bioswale on laser-leveled basins
- Diverse variety of CA-native plants for nature-based BMPs





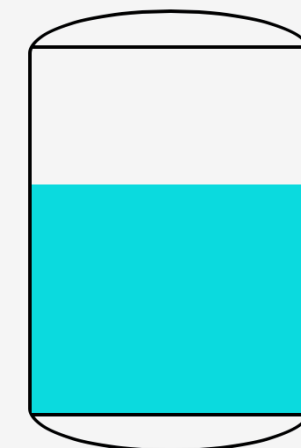
The Gaffey Nature Center

Site incorporates

- Solar powered pumps and recirculation system
- Internet connectivity
- Infrastructure for instrumentation and remote sensing



110-Gaffey WaterSilo



7.52
feet



The Gaffey Nature Center

Site incorporates

- Outdoor amphitheater and educational signage
- Experimental plots with CA-native BMP grass varieties
- Basic infrastructure for research and public involvement

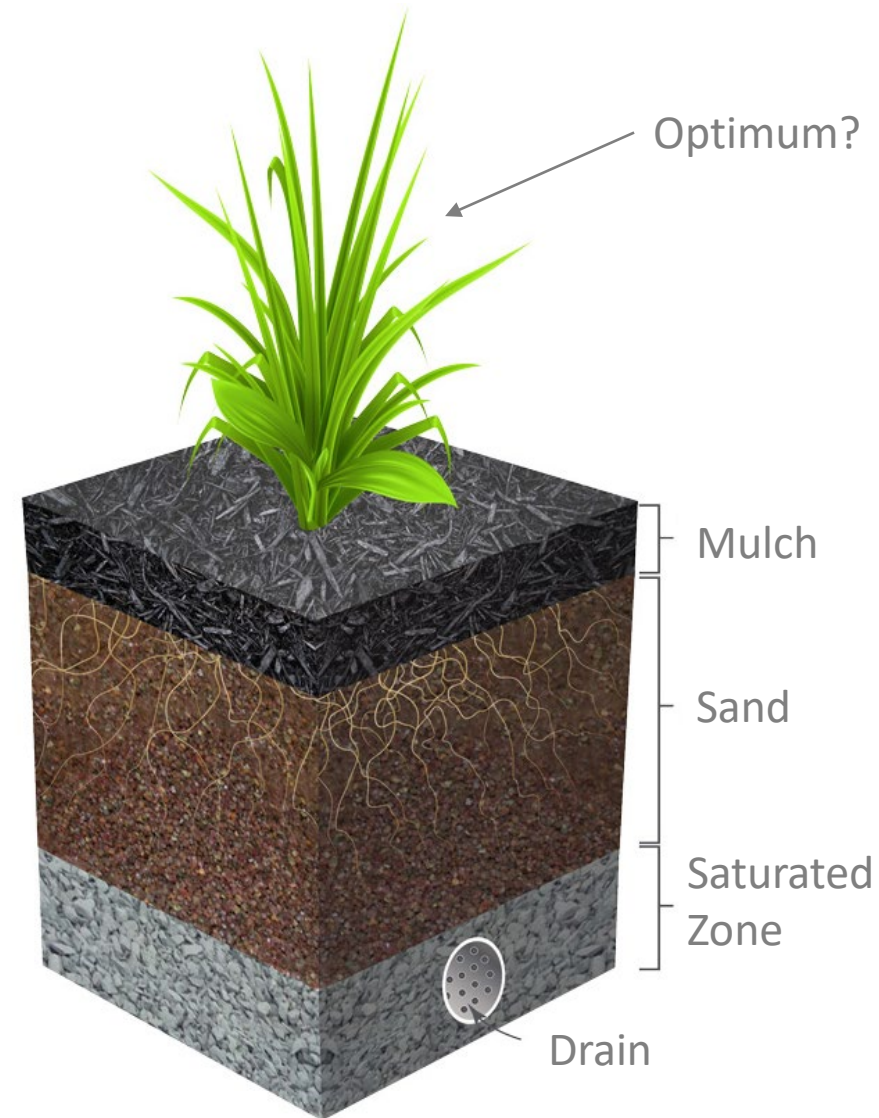
<https://youtu.be/MoOwTJ9XkoY>





Problem Statement

- Los Angeles has adopted Biofiltration for nature-based stormwater BMPs.
- The process relies on bio-diverse native species and beneficial-use varieties.
- There is no research on CA-Native species and varieties, with enormous potential.
- Urgently need credible research to guide the planning, design, O&M of biofiltration using CA-native species and varieties.





Problem Statement – Continued

- A key overlooked potential of nature-based BMPs is biomass production, cooling, and air quality improvement.
- Benefits include carbon sequestration, raw materials supply, medicinal use, animal feed, and human consumption.
- Realizing such benefits requires a community-centered approach involving intimate participation and ownership.
- A key requirement is education and training for bioswale development consistent with community interests.





Study Objectives

1. Develop Guidelines and Standard Operating Procedures for optimized design, construction, and O&M of nature-based biofiltration BMPs.
2. Incorporate guidelines in a future revision of the City and County ROW and LID manuals.





Experiment Questions

Q1: What are the optimal plants and planting practices for biofiltration in California?

Q2: What are the BMP optimization variables for maximum efficacy?

Q3: How will community skills, needs, and level of involvement influence optimization?





Study Tasks

Task	Scope
Task 1: Goals & Parameters	<ul style="list-style-type: none">• Identify goals and specify the independent variables• Define baseline conditions• Identify performance parameters to measure and monitor
Task 2: Study Setup	<ul style="list-style-type: none">• Procure equipment and tools• Construct plots• Plant selected varieties• Install instrumentation and data collection system
Task 3: Perform Study	<ul style="list-style-type: none">• Operate and maintain experimentation plots• Collect onsite samples for processing and analysis• Perform field measurements and collect data• Download the data loggers• Perform plot maintenance activities• Send samples to labs and document lab reports• Monitor site surveillance data



Study Tasks – Continued

Task	Scope
Task 4: Data Analysis	<ul style="list-style-type: none">• Develop and implement data documentation architecture and data processing procedures• Develop and execute calculation procedure for the key performance parameters• Develop and rollout dashboard for collected data and calculated performance parameters
Task 5: Data Evaluation and BMP Optimization	<ul style="list-style-type: none">• Examine and evaluate experimentation plots performance• Use result to develop and define optimized designs
Task 6: Study Deliverables	<ol style="list-style-type: none">1. Study Report – Concise account of the study objectives, data, analysis, results, conclusions, and recommendations.2. Design Manual – Practical guide to designing biofiltration nature-based BMPs3. Standard Plans – Series of plans and details as standard practice for biofiltration BMPs



Cost & Schedule

Task	Description	Cost	Completion Date
Begin Study	Execute funding agreement	N/A	Sep. 2022
Task 1: Goals & Parameters	Identify goals, baseline conditions and performance parameters	\$206,000	Nov. 2022
Task 2: Study Setup	Procure equipment, construct plots, procure and plant varieties, install instrumentation, setup communication system	\$304,000	Mar. 2023
Task 3: Perform Study	Operate and maintain plots, collect samples and data, download data loggers, maintain plots, document lab reports, monitor site	\$1,675,000	Mar. 2027
Task 4: Data Analysis	Develop and implement study architecture, perform calculations and modeling, develop and rollout dashboard	\$927,000	Sep. 2023
Task 5: Data Evaluation and BMP Optimization	Examine plot performances, develop and define optimized designs, implement optimized designs in experiment plots	\$324,000	Mar. 2027
Task 6: Study Deliverables	<ol style="list-style-type: none">1. Study Report2. Design Manual3. Standard Plans	\$360,000	Sep. 2027
Total		\$3,800,000	Sep. 2027



Funding Request

WASC	Year 1	Year 2	Year 3	Year 4	Year5	Total
CSMB	\$175,400	\$135,200	\$153,200	\$151,800	\$144,400	\$760,000
LLAR	\$175,400	\$135,200	\$153,200	\$151,800	\$144,400	\$760,000
LSGR	\$175,400	\$135,200	\$153,200	\$151,800	\$144,400	\$760,000
NSMB	\$175,400	\$135,200	\$153,200	\$151,800	\$144,400	\$760,000
ULAR	\$175,400	\$135,200	\$153,200	\$151,800	\$144,400	\$760,000
TOTAL	\$877,000	\$676,000	\$766,000	\$759,000	\$722,000	\$3,800,000*

* Labor – 67%, Materials 37%



Summary of Benefits

This Study will deliver :

- a) Optimum design, construction, operation, and maintenance of biofiltration systems.
- b) Enhanced uses of green infrastructure for efficient biofiltration, community enhancement, and for combating climate change.
- c) Sustainable water storage and sourcing solutions for consumptive use supply during dry periods.
- d) Renewable energy solutions for biofiltration operation and maintenance.
- e) Increased educational benefits of nature-based BMPs for communities.



Questions?



San Fernando Calles Verdes

Technical Resources Program

Fiscal Year 2022-2023

Upper Los Angeles River Watershed

Matt Baumgardner, City of San Fernando

Katie Harrel, CWE

Cindy Villegas, TreePeople



Project Overview

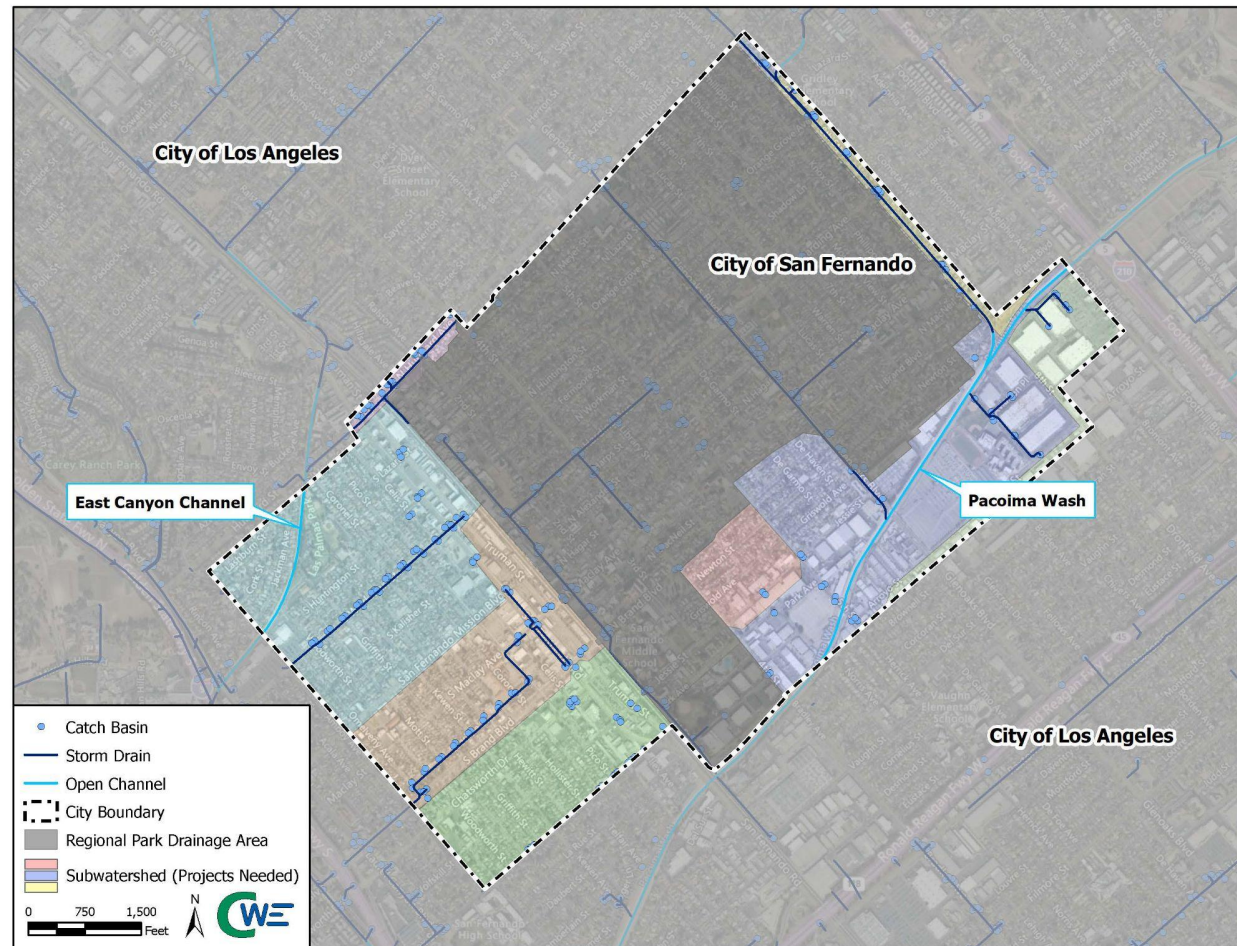
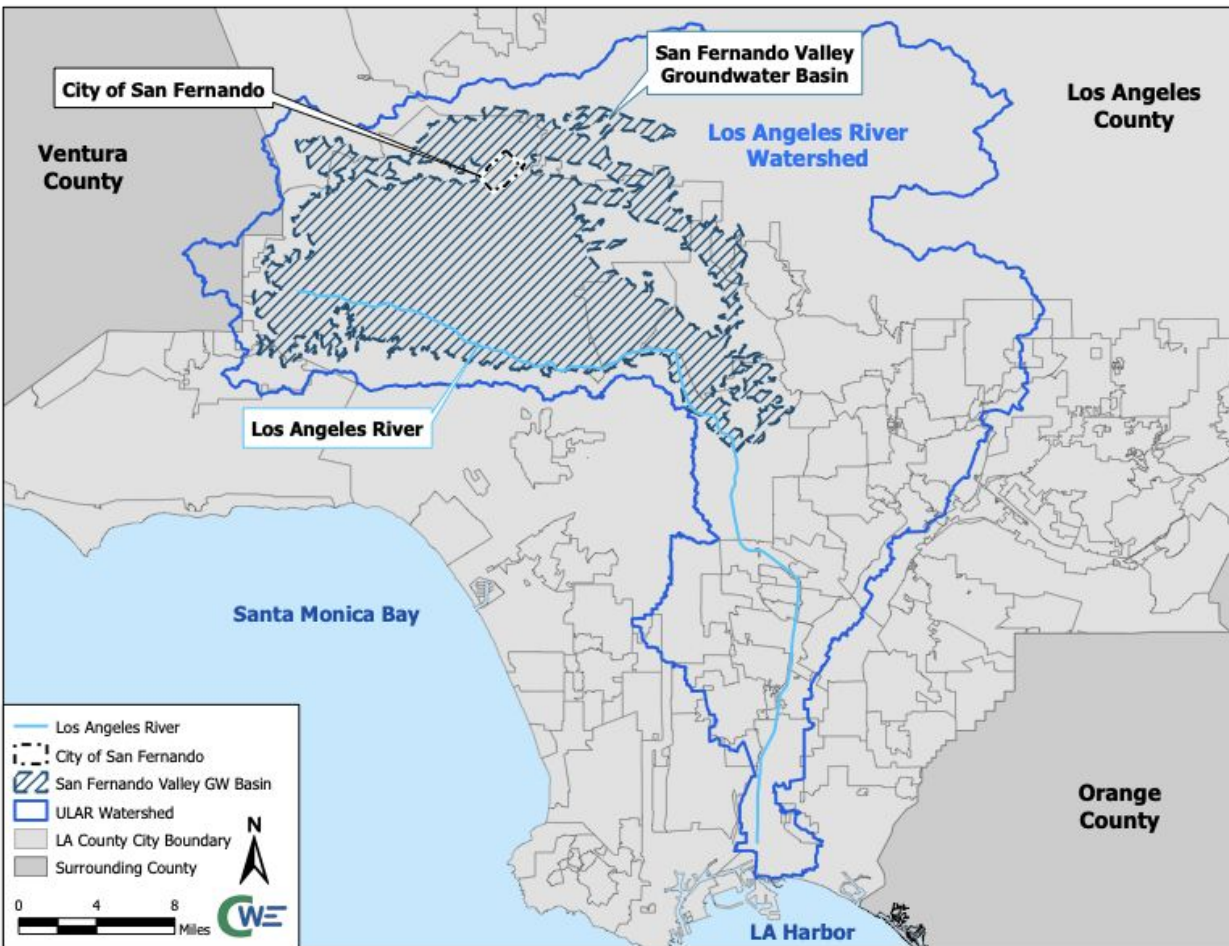
Conduct a feasibility study for areas in the City of San Fernando not captured by current Projects to maximize the City's stormwater capture, water quality, water supply, and flood control potential. Potential project sites have been identified for further evaluation.

- **Primary Objective:** Identify, evaluate, and prioritize a multi-benefit water quality project(s) in the City of San Fernando with an emphasis on community involvement and nature-based solutions. To turn this planning effort into a citywide implementation plan. To tie in to the goals of the new County of Los Angeles Sustainability Plan.
- **Secondary Objectives:** Provide the City of San Fernando with improvements to its natural infrastructure through improvements in green space and mitigation of extreme heat. Connect our community with these infiltration projects and helping them understand our key role within the region. Be a model for other small communities that can take steps to recharge the groundwater basin and keep runoff out of drains.
- **Project Status:** Planning.
- **Total Funding Requested:** \$300,000



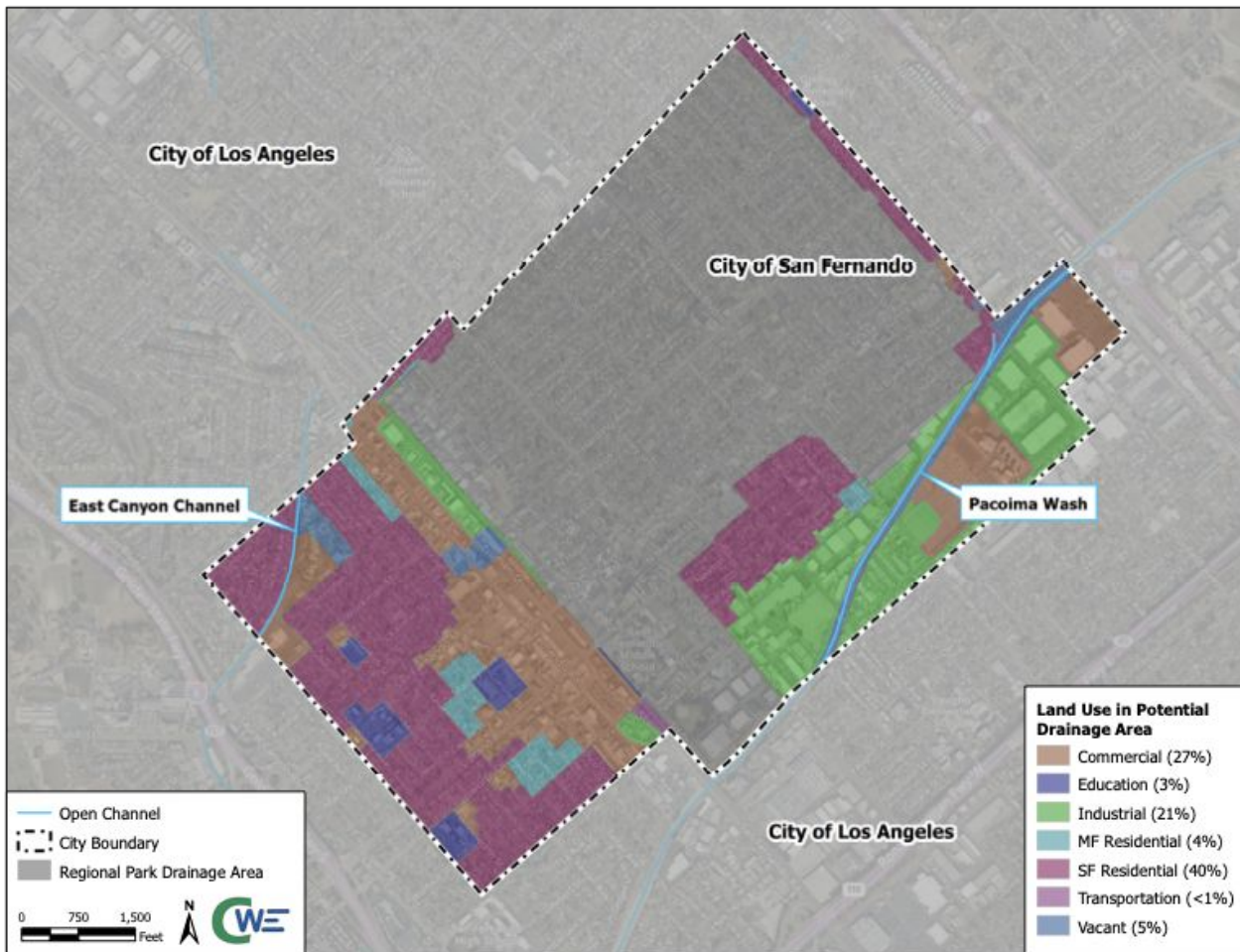


Project Location





Project Location





Project Background

Identify, evaluate, and prioritize multi-benefit water quality projects in the City's most disadvantaged areas. These areas are not captured by the San Fernando Regional Park Infiltration Project. The City will evaluate and prioritize based on:

- City-owned properties/right-of-way
- Community benefit and priority opportunities
- Location in subwatershed
- Urgent need (water quality, flooding, infiltration, ADA, etc.)
- Tributary land uses
- Partnership opportunities with LADWP and LA County Flood Control
- Soil characteristics
- Future implementation needs (Capital Investment Plan, pavement rehabilitation, utility upgrades, etc.)



Project Details

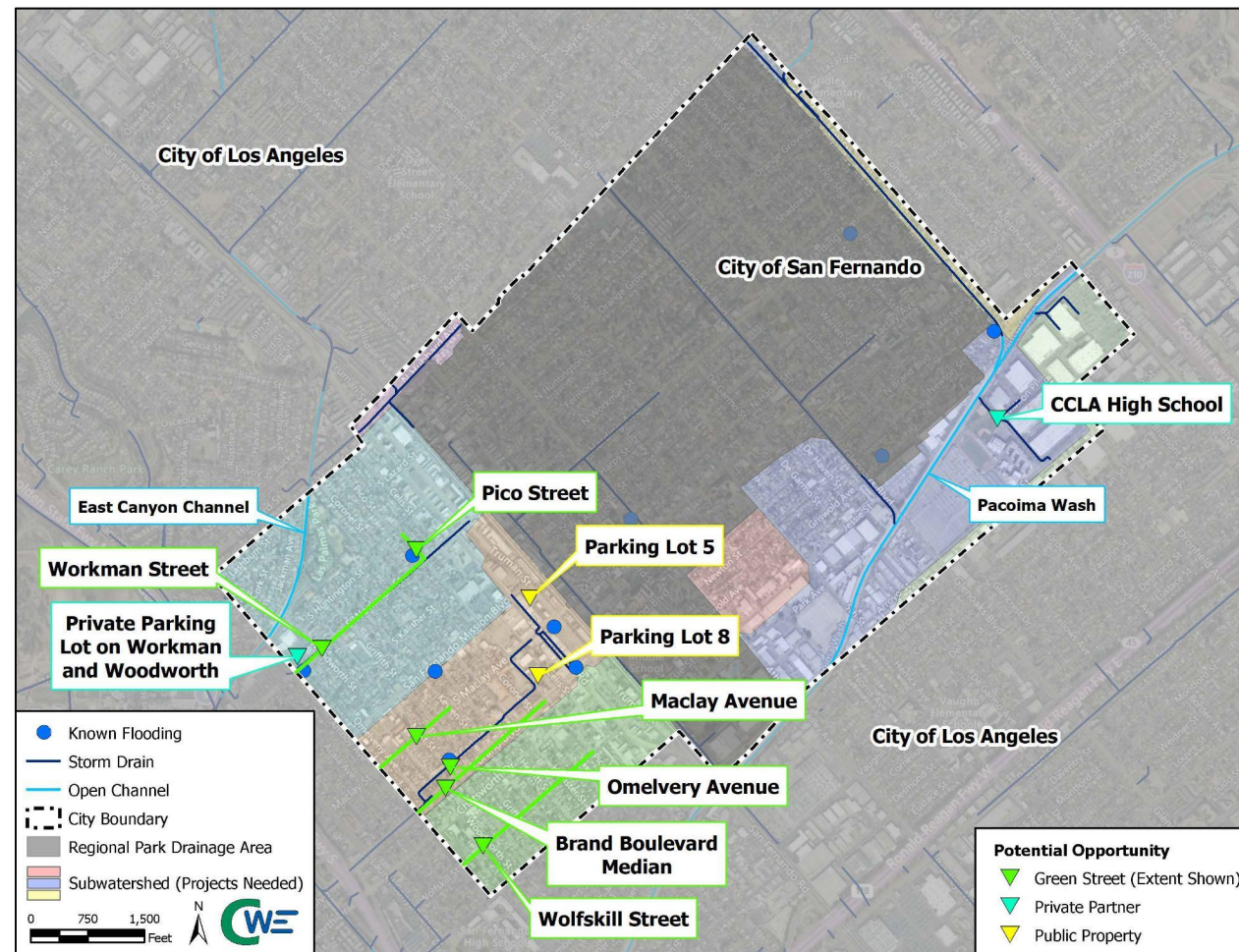
Potential opportunities have been identified and will be further evaluated to determine feasibility as a future implementation project.

Project(s) expected to capture approximately 200 acres of tributary area.

Green Street opportunities will be evaluated. Preliminary opportunities have been identified on Brand Blvd, Workman St, Maclay Ave, Wolfskill St, O' Melveny Ave, and Pico St.

Public properties such as Parking Lot 5 and Parking Lot 8 will also be evaluated.

The City has made it a priority to focus on local water resilience which includes maximizing recharge into the San Fernando Groundwater Basin.





Community Investment Benefits and Nature Based Solutions

Project(s) will be done in partnership with:

- Residents
- Local Businesses
- Community-based organizations
- Non-profit organizations

Project(s) will include multi-benefit, nature-based solutions to ensure a comprehensive approach to stormwater mitigation

- Key components will include: tree planting, native vegetation, bioswales, enhancing soils

Create a community-driven process to organize input that will identify project priorities and locations





Cost & Schedule

Phase	Description	Cost	Completion Date
Planning	Conduct study and prioritize projects	\$300,000	Pending SIP
Implementation	TBD pending TRP	TBD	TBD
O&M	O&M following implementation	TBD	TBD
Monitoring	Monitor/assess effectiveness	TBD	TBD
TOTAL		\$300,000	

- Annual, lifespan, and lifecycle costs will be assessed during the Planning phase



Funding Request

Year	SCW Funding Requested	Phase	Efforts during Phase and Year
1	\$300,000	Planning	TRP, feasibility study, funding pursuit
2	TBD	Design (?)	Design of recommended implementation
3	TBD	Implementation (?)	Construction based on design
4	TBD	Implementation (?)	Construction based on design
5	TBD	O&M/monitoring (?)	Perform maintenance and monitor effectiveness
TOTAL	\$300,000		

- Leveraged Funding TBD following TRP
- Future requests are anticipated pending findings of TRP



Questions?



Camino Verde Pocket Park Regional Stormwater Capture Demonstration Project

Funding Program: Technical Resources Program (TRP)

Project Lead: City of South Pasadena

Presenters: Ted Gerber, Acting Public Works Director

Cameron McCullough, JLHA



Project Overview

The City is requesting a feasibility study for the Diversion, capture, and infiltration or use of regional stormwater flows at Camino Verde Pocket Park.

- Objectives – improve water quality (primary), water supply, and flood management, and enhance park space
- Project Status – concept planning
- Total Funding Requested: \$300,000





Project Overview

Summary

- Stormwater capture area – up to 284 acres
- Estimated system capacity – up to 4.8 acre-feet
- Located at a pocket park and adjacent street
- Immediately adjacent to the storm drain and a sewer trunk line

Benefits

- Water quality – protects LA River
- Water supply – via either aquifer recharge, reclamation, or irrigation reduction
- Community – Small disturbed area, park improvements



Project Overview

Background

- The ULAR EWMP requires the City to implement stormwater capture projects to protect the main stem of the LA River
- The EWMP lists Van Horne Ave at the south end of Camino Verde pocket park as a potential project location
- The project is in a sub-basin (636280) that needs a regional project
- A 2021 desktop analysis revealed this project location as ideal, for the reasons described on the following slides



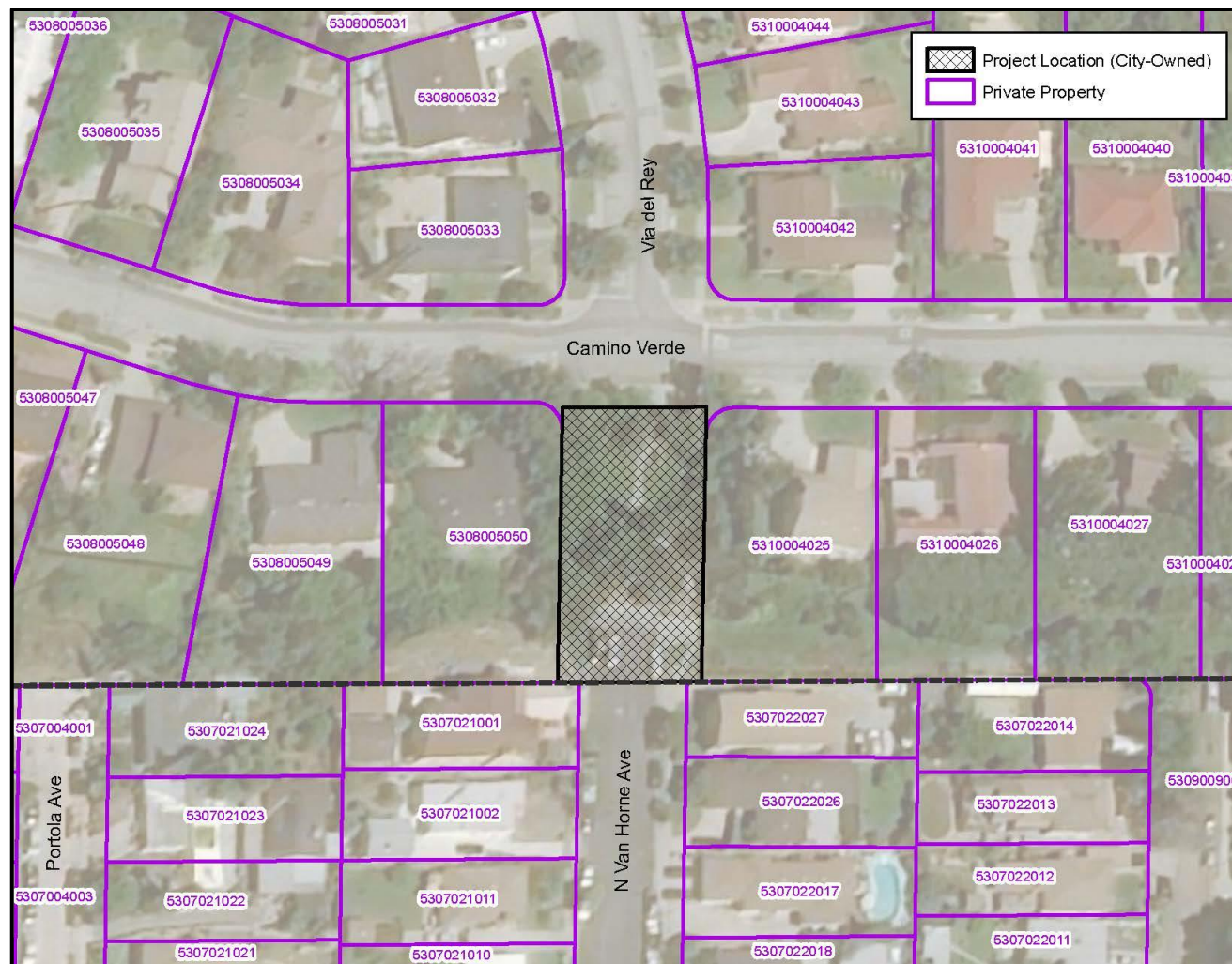
Project Location: Pocket Park at Camino Verde & Via Del Rey



South view from Van Horne Ave, where the stormwater capture system would be installed



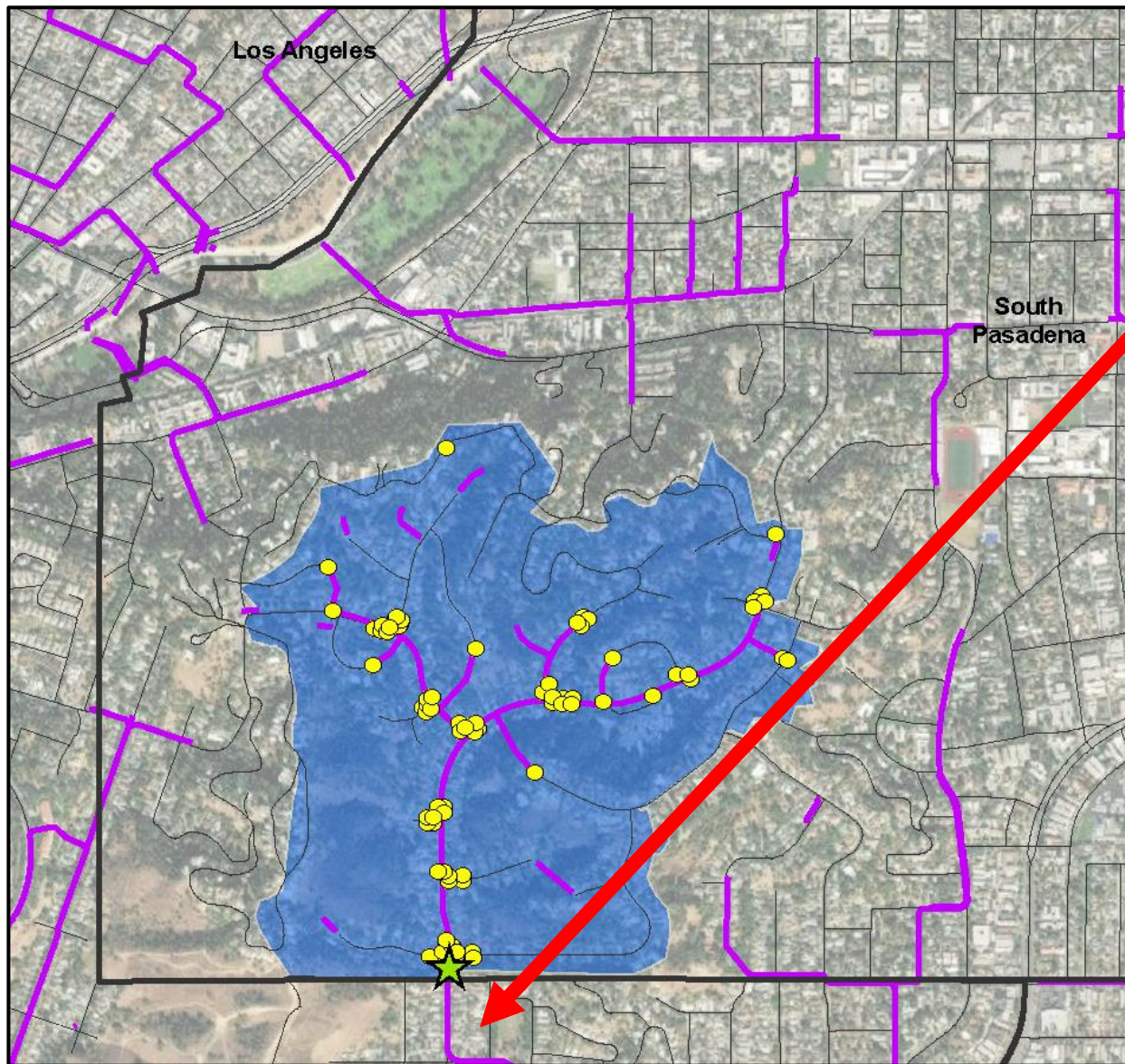
Project Location: Pocket Park at Camino Verde & Via Del Rey



Parcel view



Project Location: Watershed Area (Upper LA River Reach 2)

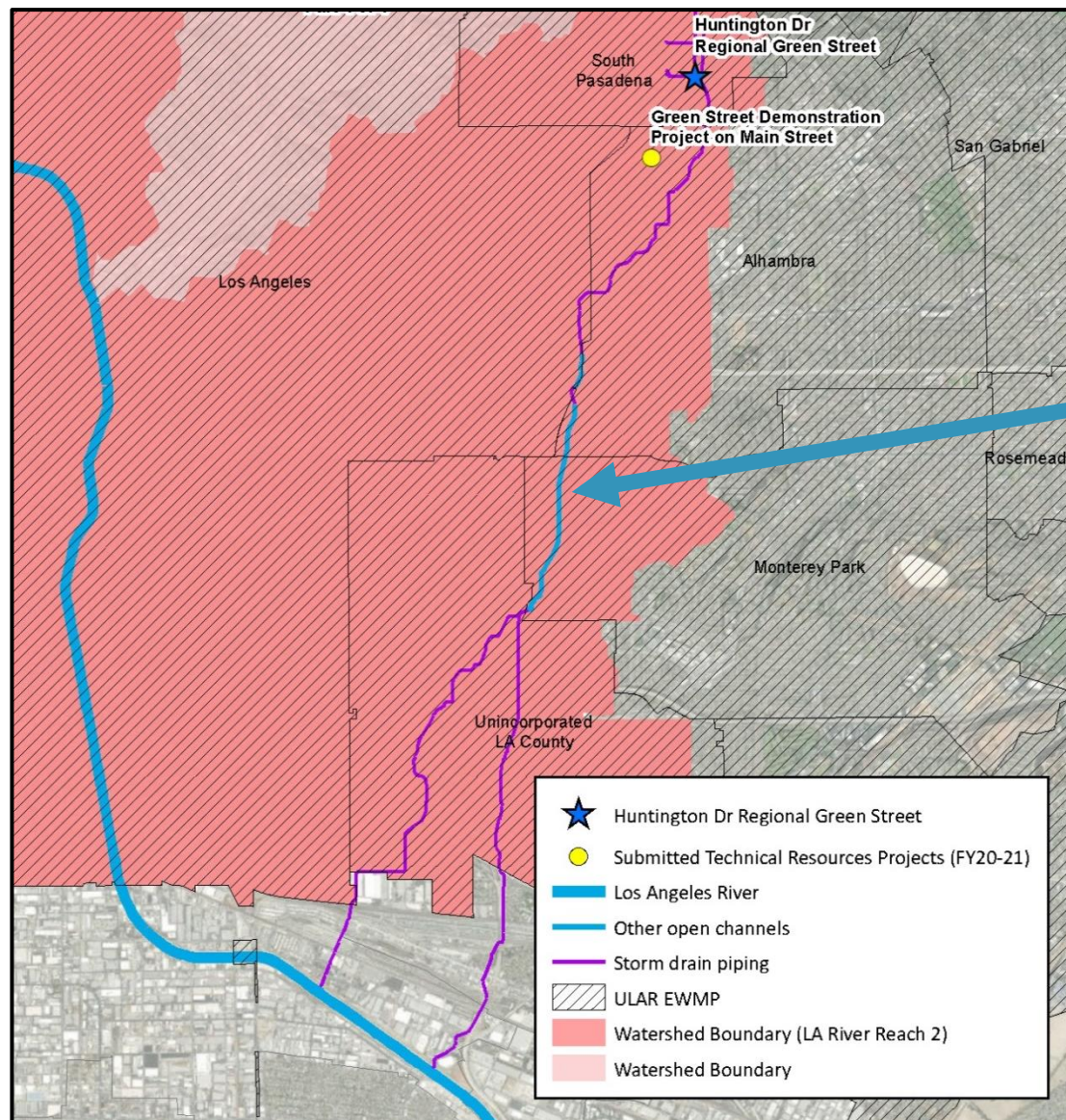


The Project drains to:

- Underground storm drains
- Laguna Channel
- LA River



Project Location: Watershed Area (Upper LA River Reach 2)

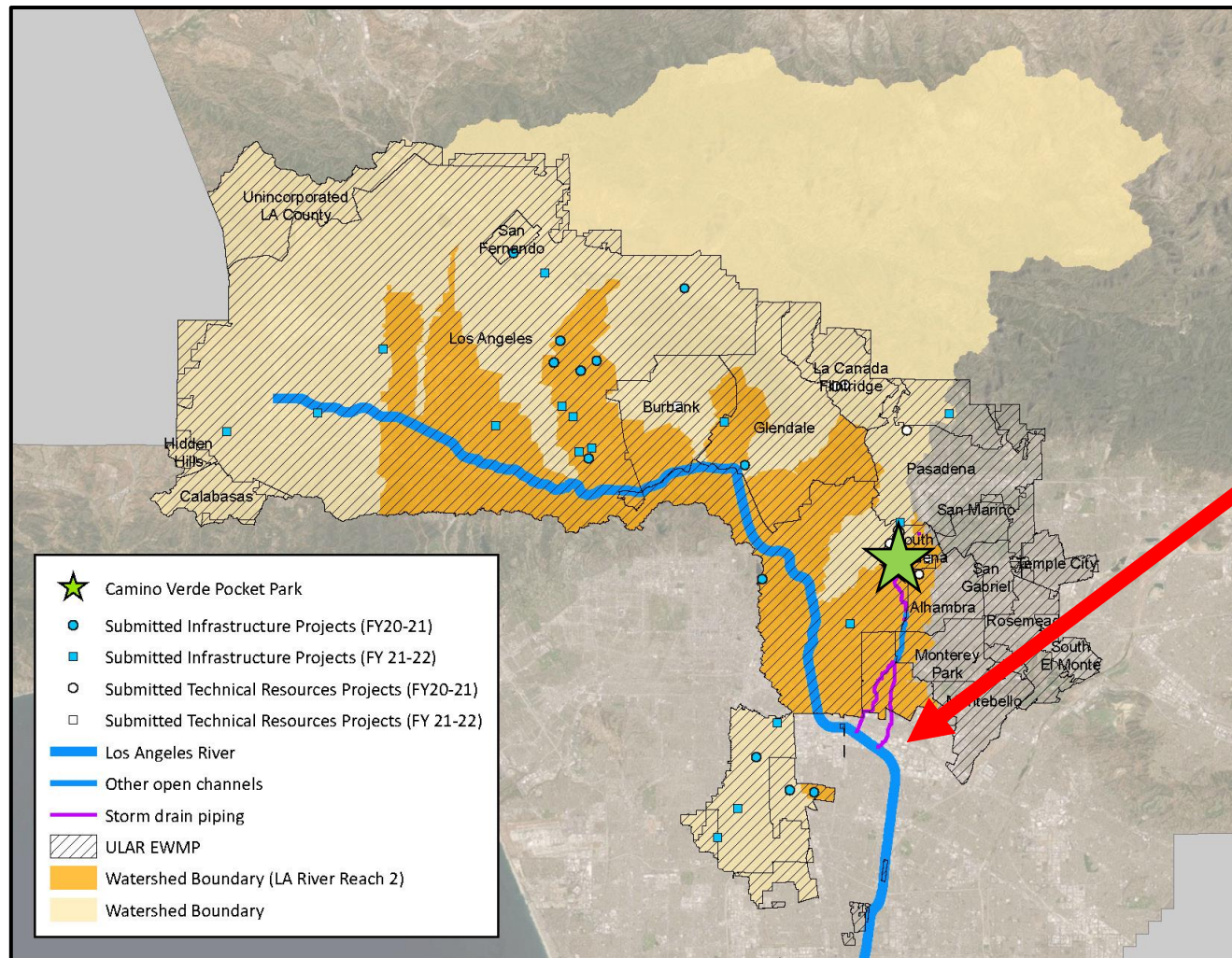


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Project Location: Watershed Area (Upper LA River Reach 2)

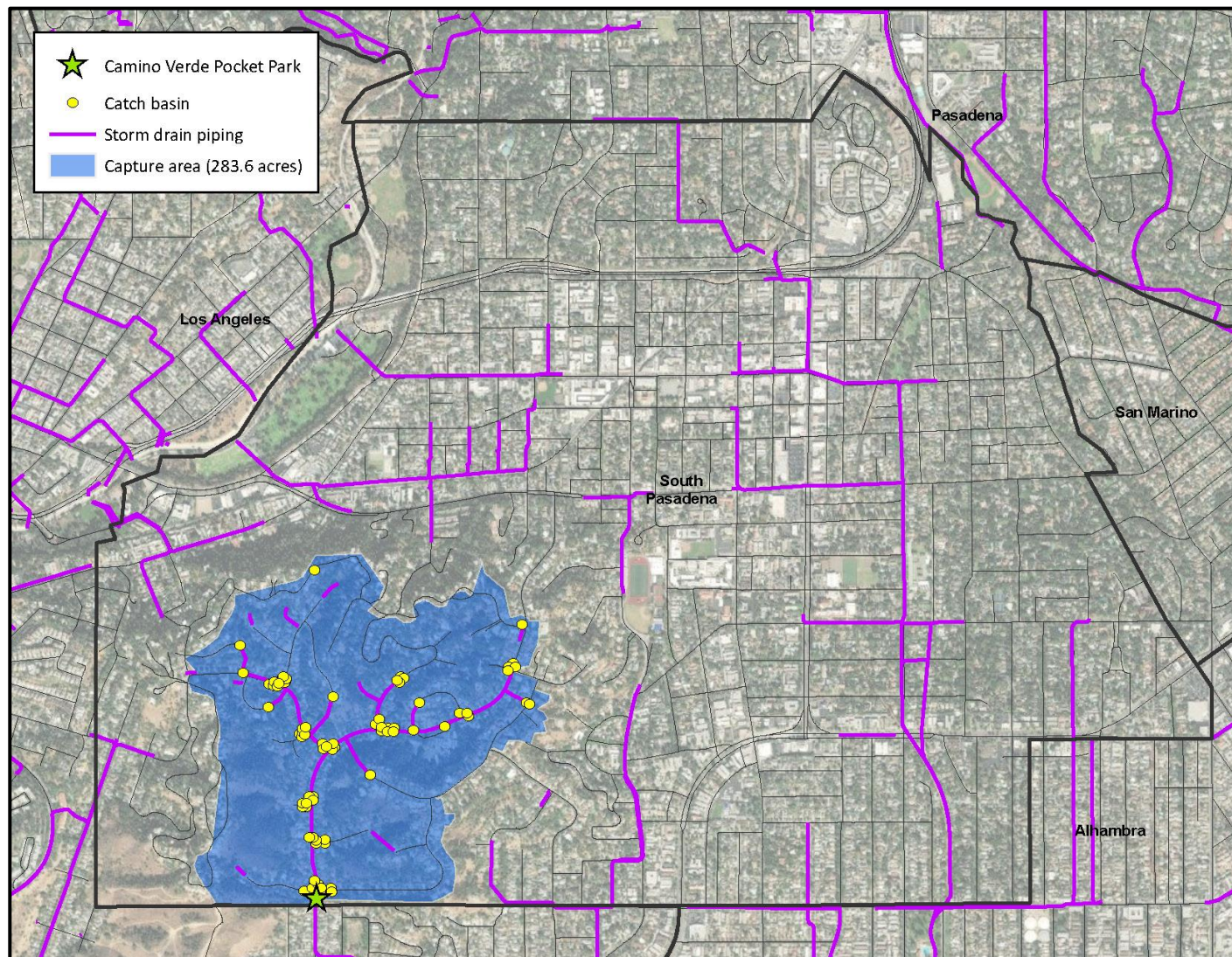


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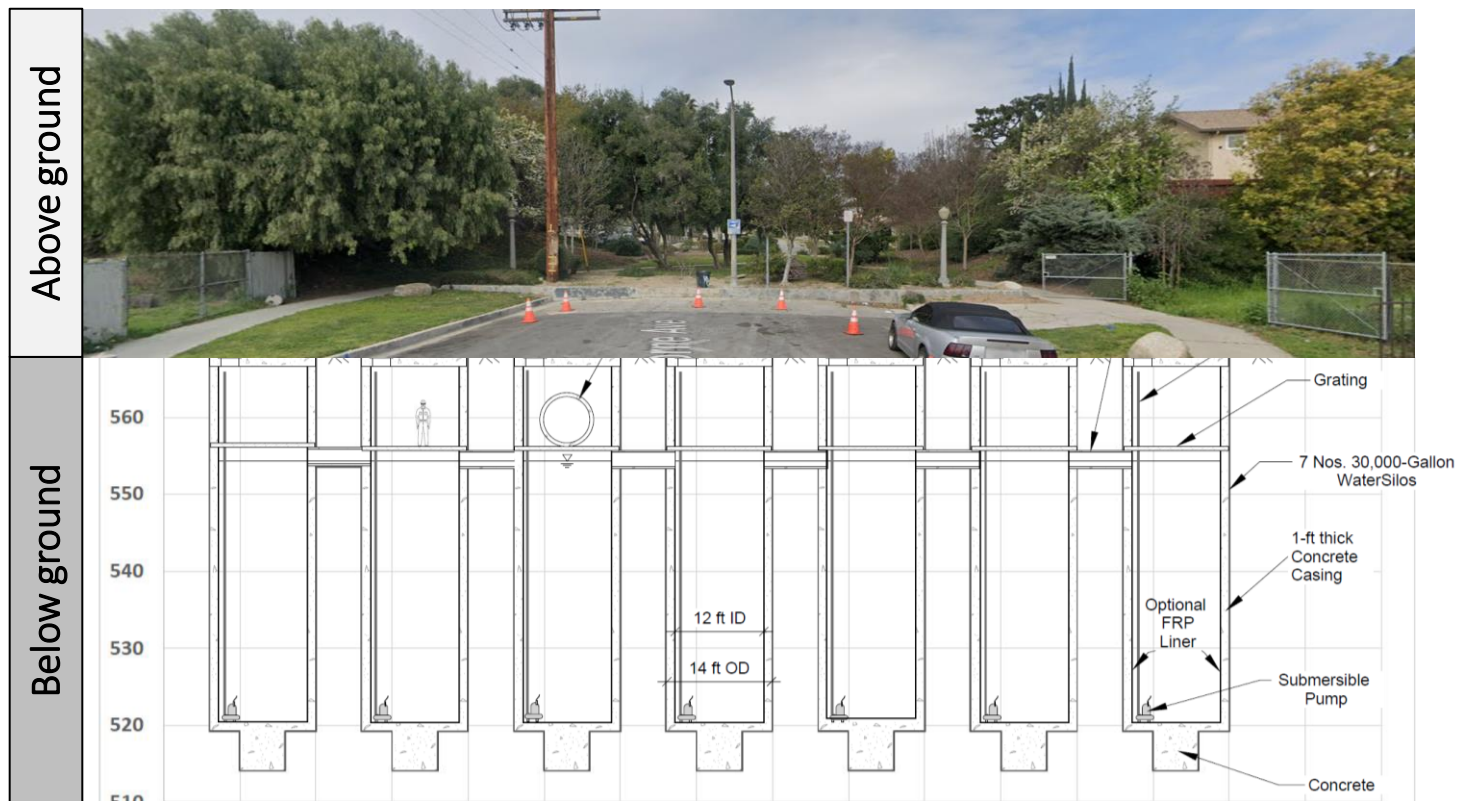
Project Location: Capture Area



The Project can capture up to 284 acres of surface drainage



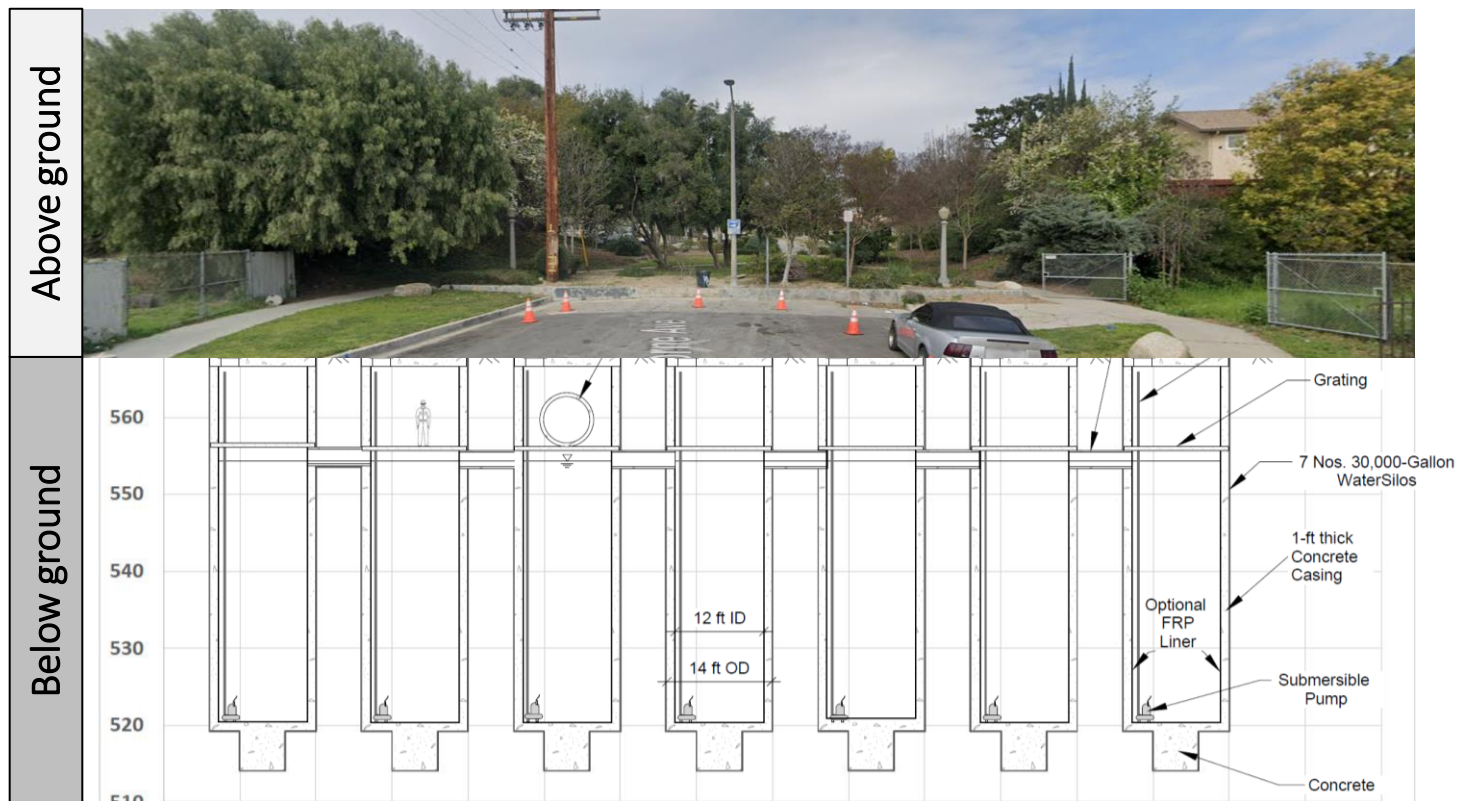
Benefits: Water Quality



Polluted urban runoff could be captured beneath the road south of the park in underground cisterns. Propriety devices known as WaterSilos by Seitec are displayed in these images. The storage capacity is up to 4.8 acre-feet.



Benefits: Water Supply



Captured stormwater would infiltrate (if feasible), recharging groundwater. Otherwise, the captured water could be released slowly to an existing 15-inch sanitary sewer trunk line. Captured runoff could also supplement irrigation.



Diversion Method



- The underground storm drainpipe running north-south from the north (**purple line**) is diverted to the capture systems (**green circles**)
- For a sewer diversion, the captured water is slowly released to the sewer trunk link (**thick orange line**)
- Overflow would continue south down the storm drainpipe



Diversion Method



- **Constraints:** working near homes and impacting street parking, other constraints TBD through the feasibility study
- **Alternatives:** Relocate to within the pocket park or north of the park at Camino Verde and Via Del Rey



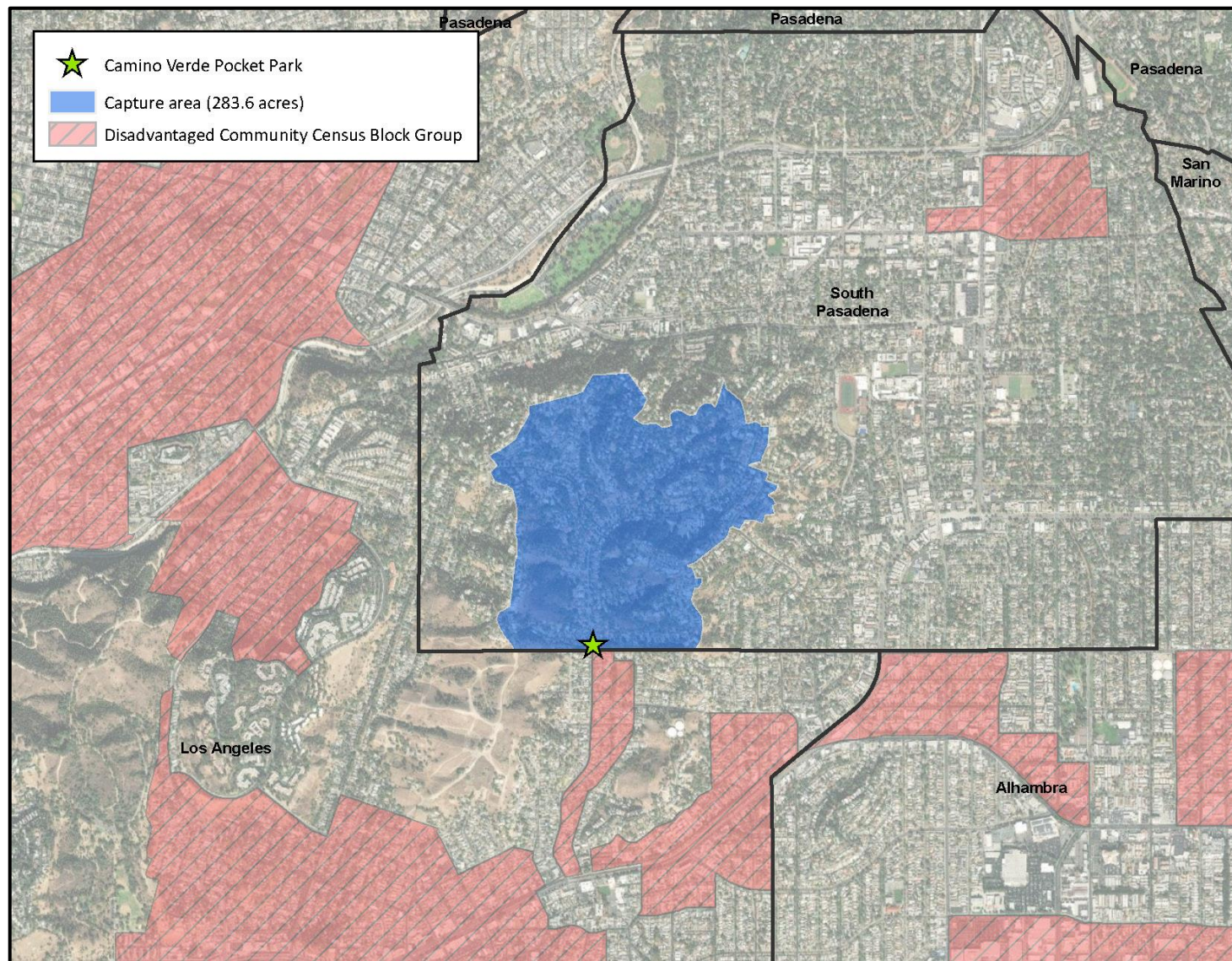
Community Benefits and Nature-based Solutions

Park improvements

- City policy and General Plan goals include developing distributed pocket parks with easy access by residents
- Improvements under consideration include benches, cafe/picnic tables, fitness stations, small play courts, art pieces, or a highly concentrated Miyawaki urban forest
- The Park connects City residents to Elephant Hill Open Space (1,000 ft to the SW). The park then serves as an ideal location to include interpretive signage to educate residents on the project.



Disadvantaged Communities



There is a disadvantaged community directly to the south of the project



Cost Estimate & Projected Schedule

Phase	Description	Cost	Completion Date
Planning & Design	Includes early concept design, pre-project monitoring, feasibility study development, site investigations, formal project design, intermediate and project completion audits, CEQA and other environmental impact studies and permitting.	\$450,000.00 ^C	TBD
Construction	Construction	\$1,500,000.00 ^C	TBD
O&M	Maintenance	\$14,000.00 ^A	TBD
O&M	Operation	\$5,000.00 ^A	TBD
O&M	Monitoring	\$5,000.00 ^A	TBD
TOTAL	50 year Project Life Span	\$3,150,000.00	

A = Annual, C = Capital



Funding Request

Year	SCW Funding Requested	Phase	Efforts during Phase and Year
1	\$300,000.00	Planning and Design	Feasibility Study, 2022
2			
3			
4			
5			
TOTAL			

- If funded, the City plans to follow with a submission of an SCWP infrastructure application



Questions?