STORMWATER CAPTURE AND GROUNDWATER RECHARGE FEASIBILITY STUDY IN VENTURA COUNTY UNINCORPORATED COMMUNITY OF EL RIO

December 10, 2022

Title:	El Rio Stormwater Capture and Groundwater Recharge Feasibility Study
Date:	December 10, 2022
Watershed:	Santa Clara River
Funding Source:	Proposition 1 Disadvantaged Community Involvement Program (DACIP)
Project Type:	Technical Assistance
Total Project Cost:	$134,027
Lead Agency:	County of Ventura represented by Ventura County Public Works Agency – Watershed Protection's County Stormwater Program
Project Team:	Ewelina Mutkowska, MSc, Project Manger Hayley O'Grady, PE, Engineer Jill Jennings, Public Outreach Lead
Consultants:	Remi Candaele, PE, Q3 Consulting, Inc. Amanda Antonelli, Rincon Consultants, Inc. Heidi Hayes, TheAgency, Inc.

Contents

LIST OF FIGURES

LIST OF APPENDICES

1 Project Name

El Rio Stormwater Capture and Groundwater Recharge Feasibility Study.

2 Proponent

County of Ventura represented by Ventura County Public Works Agency – Watershed Protection District's County Stormwater Program.

3 Type

Technical Assistance to conduct feasibility study for stormwater capture and groundwater recharge resulting in selection of the most feasible alternative, project concept, and 30% project design.

4 Location

The proposed El Rio Stormwater Capture and Groundwater Recharge Feasibility Study (Study) is located in the Ventura County unincorporated community of El Rio. The site is located at the Rio Plaza Elementary School at 600 Simon Way, Oxnard, California (Assessor's Parcel Number 144-0-080-015). The community is bordered by the City of Oxnard to the west at East Vineyard Avenue, to the east at North Rose Avenue, to the south at U.S. Highway 101, and by groundwater recharge basins to the north, owned and operated by United Water Conservation District. The site is immediately surrounded by residential land use area. See Figures 1 and 2 for project maps.

The site is within the Santa Clara River Watershed (SCR). The SCR starts in the San Gabriel Mountains in Los Angeles County, flows through Ventura County, and ends at the Pacific Ocean between San Buenaventura (Ventura) and Oxnard.

5 Cost

The total cost for the Study was $134,027.

6 User Needs Supported Categories (Generated from TAPPED)

According to an assessment of community and institutional needs, El Rio's top water-related issues are related to drinking water quality, the high cost of water, and the need for more trees and green space. Other notable issues include flooding and stormwater quality impacts on the community.

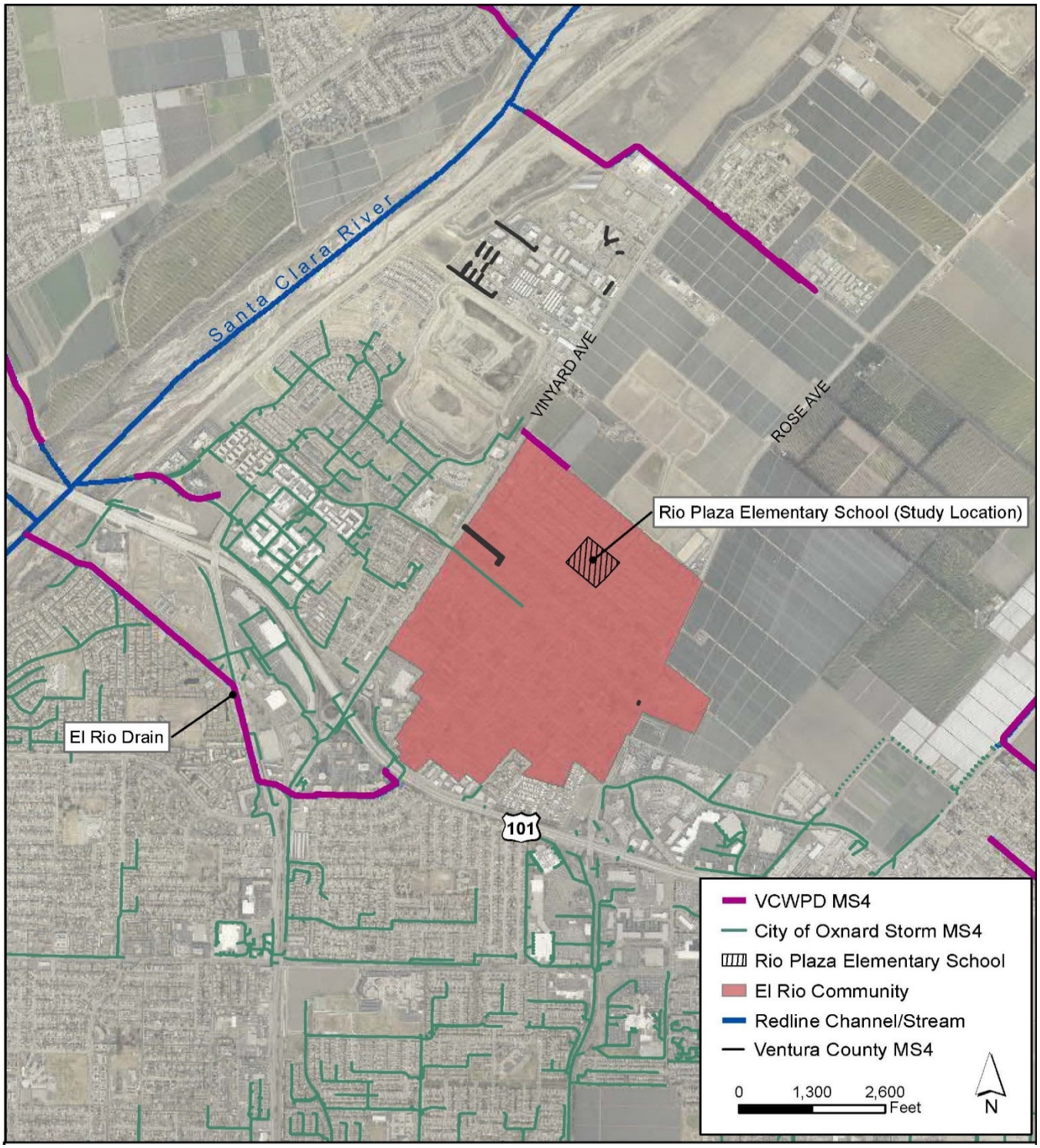


Figure 1 Vicinity Map

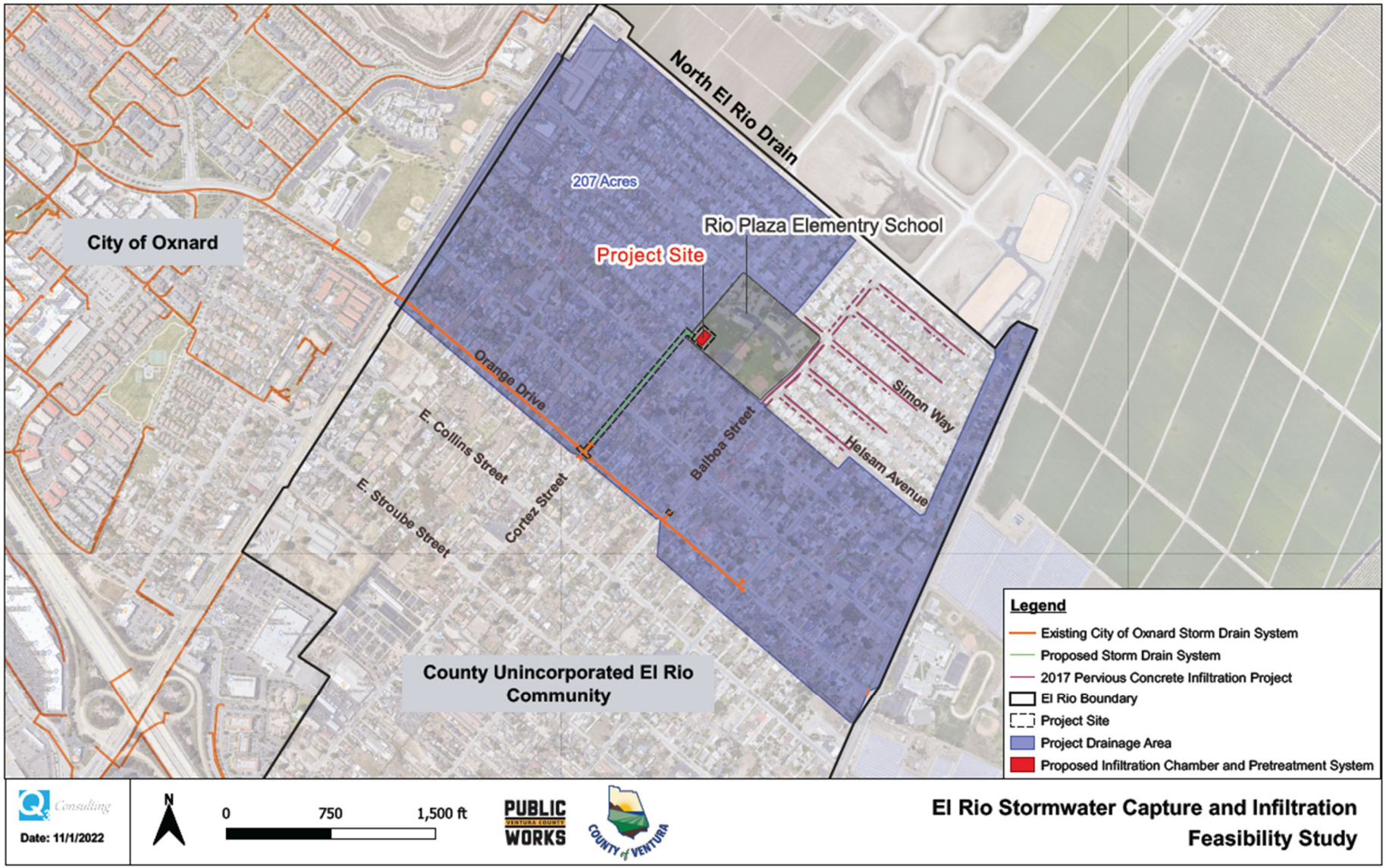


Figure 2 Project Map

7 Project Abstract

As an operator of a municipal storm sewer system (MS4) the County of Ventura is investigating the feasibility to plan, design, and construct regional stormwater mitigation best management practices (BMPs) to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) MS4 Permit, Total Maximum Daily Load (TMDL) for Bacteria in Santa Clara River, and the Statewide Trash Amendments. The goal of this Study, funded by a Proposition 1 grant from the California State Department of Water Resources, is to evaluate the feasibility of a stormwater mitigation BMP in El Rio, and if found feasible, prepare a concept and preliminary design for future grant applications for funding to implement the project. The scope of the proposed Project included technical assistance for site assessments, a feasibility study, an engineering preliminary design to develop a 30% project concept, and public outreach to the El Rio community residents (in English and Spanish). The proposed Project will be included in the Santa Clara River Watershed Management Program (https://www.vcstormwater.org/programs/watershed-management-program) and included in the Ventura County Municipal Stormwater Resources Plan (https://www.vcstormwater.org/publications/plans/stormwater-resource-plan.)

8 Project Outcomes

Rio Plaza Elementary School, located at 600 Simon Way, was chosen as the preferred location for the proposed Project. The surrounding Ventura County unincorporated community of El Rio is susceptible to flooding during storm events, see Appendix A for photos, and this on-going issue can be mitigated with the proposed storm drain improvements. The location was also chosen due to the favorable geotechnical conditions and high infiltration rates, large treatment area of 207 acres of El Rio urban area, no land acquisition cost due to collaboration with Rio School District, and the public education potential. The captured stormwater estimated at 78 acre-feet per year, will provide for sustainable groundwater recharge.

The study assessed the feasibility of an underground precast concrete infiltration chamber underneath the school's baseball fields. A feasibility report was prepared based on the study findings; the report included hydrology analysis, geotechnical evaluations, cost estimates, potential project timeline, and anticipated benefits. The full feasibility report is included in Appendix B.

An underground concrete chamber, with a surface area and volume of approximately 11,005 square feet and 51,200 cubic feet, respectively, is proposed to fully (100%) capture and infiltrate the runoff volume from the 85th percentile, 24-hour storm event, and capture and infiltrate most (95%) of the 1-year, 24-hour storm event volume. The proposed Project would likely also mitigate some effects of flooding within the treatment area of 207 acres of El Rio urban area. An additional benefit of the proposed Project would be sustainable recharge of the local groundwater basins, including the Santa Paula and Oxnard Forebay subbasins. A high-capacity, in-line gross solids removal device would be included as a pre-treatment system that would remove an estimated 561 gallons of trash annually. This would make 207 acres of the El Rio community in compliance with TMDL and Statewide Trash Amendments requirements. The 30% project design can be found in Appendix B.

Overall, this proposed Project would offer benefits of stormwater capture, surface water quality improvement, groundwater recharge, trash capture, flood mitigation, public education, and Santa Clara River water quality improvements.

9 Project Photos / Exhibits

See Appendix A for photos.

10 Community / Participant Testimonial (If available / applicable)

Two presentations are planned for January 2023 to showcase the Study. First presentation at the El Rio/Del Norte Municipal Advisory Council meeting scheduled for January 19, 2023, and another presentation at the Santa Clara River Watershed Committee (SCRWC) scheduled for January 26, 2023. The SCRWC stakeholders include public agencies, non-governmental organizations, non-profit organizations, private citizens, and many more. More information about the SCRWC is available at https://www.scrwatershed.org/index.php/vision. The Power Point slides for the presentations are included in Appendix C.

Educational brochures and a website were prepared about the Study. The educational brochures were prepared in English and Spanish and include information about feasibility studies, not only in El Rio but also for Saticoy Park, included in Appendix D. The website includes information from the Study, and can be found at this link http://uninc.vcstormwater.org/projects/stormwater-capture-studies/el-rio-stormwater-capture. The website link is also provided in Appendix E.

Appendix A

Photos

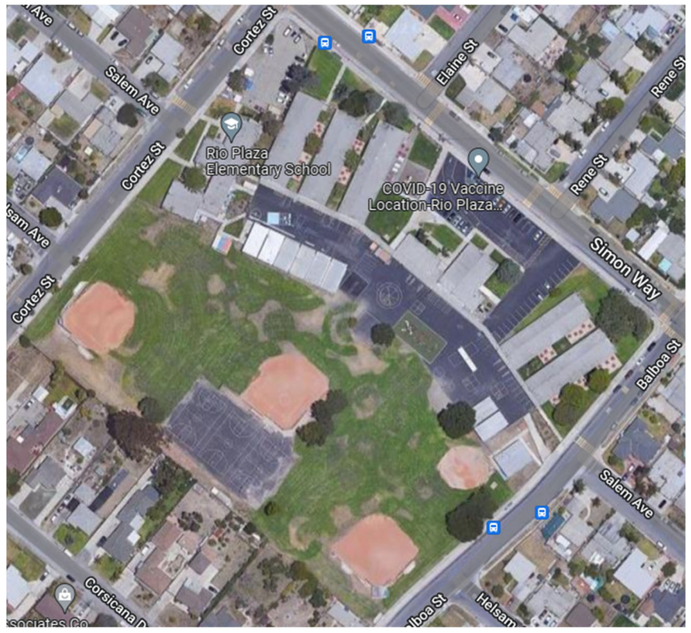
Appendix A – Photos

Storm event on 10/25/2021 with 0.75” water in the El Rio community

Storm event on 10/25/2021 with 0.75” water in the El Rio community

Storm event on 10/25/2021 with 0.75” water in the El Rio community

Proposed project location – Rio Plaza Elementary School



Aerial view of Rio Plaza Elementary School

Surrounding area near proposed project location

Appendix B

Feasibility Report and 30% Project Design Plans, Prepared by Q3 Consulting, Inc.

https://countyofventuraca-my.sharepoint.com/:f:/g/personal/jill_jennings_ventura_org/EjSHy4uR9OhLuATznhiP98EB65nGHSy4-pUoZiOlOWbomA?e=taw5co

Appendix C

Power Point Presentation, Presented at the El Rio/Nyland Acres Municipal Advisory Council and the Santa Clara River Watershed Committee Meetings

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El Rio Stormwater Capture Feasibility Study

Presentation to
El Rio/Del Norte Municipal Advisory Council

Q3 RINCON

January 19, 2023

Agenda

Introduction

- Ventura Countywide Stormwater Permit
- Santa Clara River TMDLs
- California Trash Capture Requirements

Study Details

- Project Purpose
- Project Description
- Community Benefits

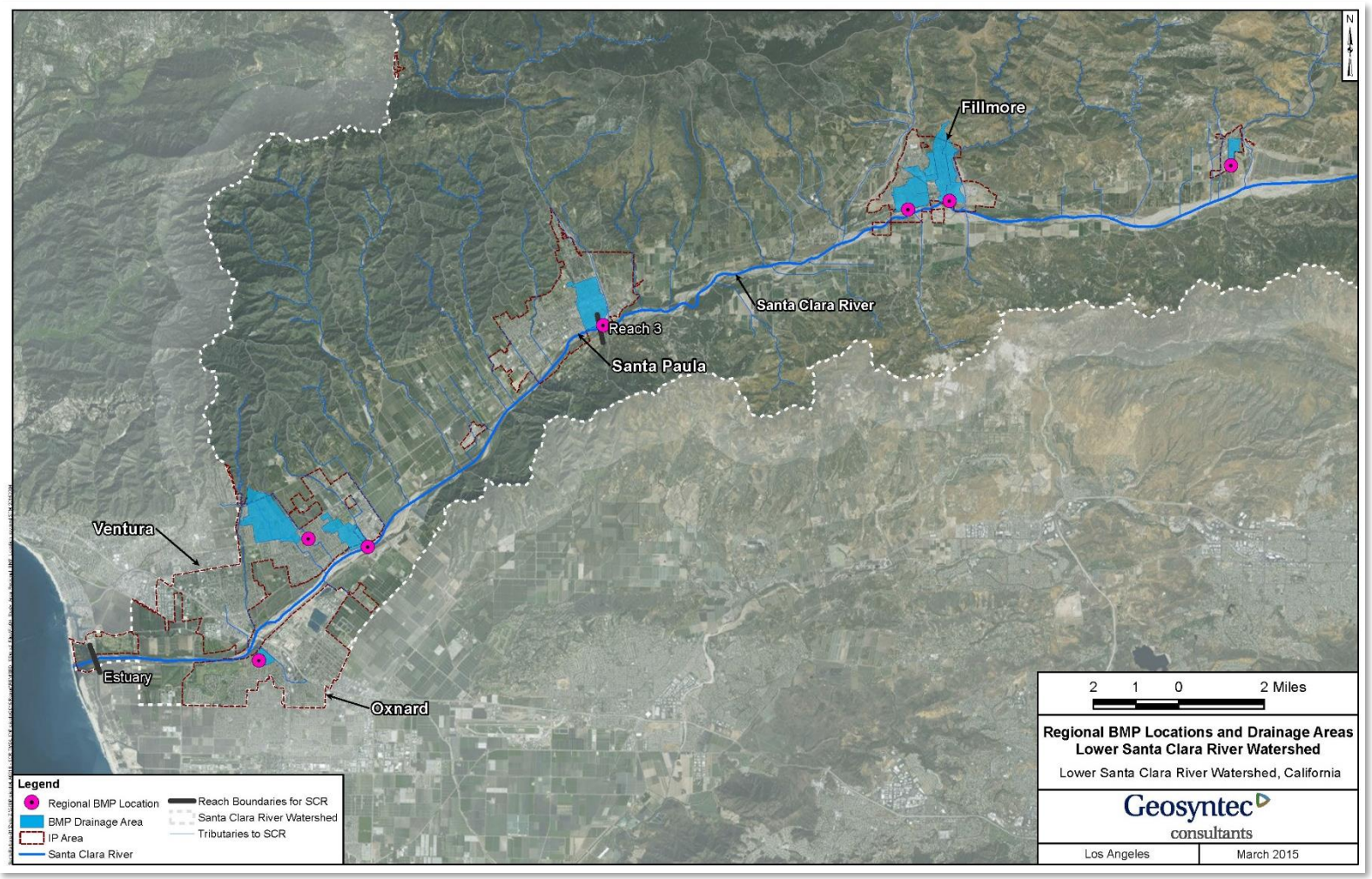
Question and Answer

Ventura Countywide Stormwater Permit

2012 Santa Clara River Bacteria Total Maximum Daily Loads (TMDLs)

- ✓ TMDL effective March 21, 2012
- ✓ Dry weather compliance effective March 21, 2023
- ✓ Wet weather compliance effective March 21, 2029

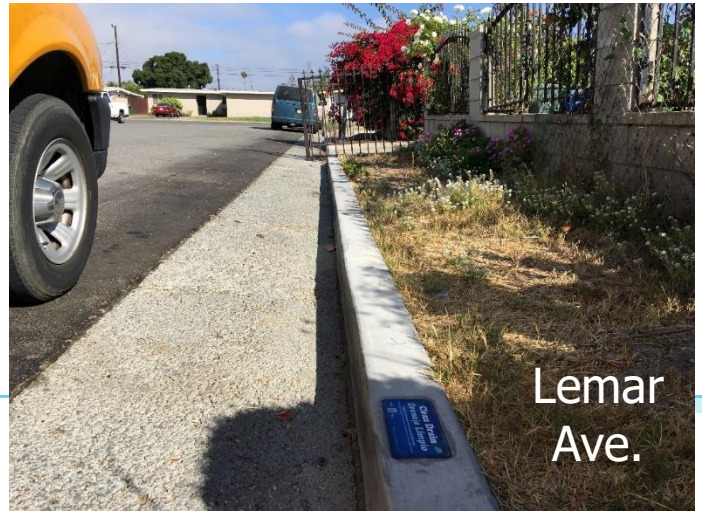
2015 Santa Clara River Bacteria TMDL Implementation Plan



2015 California Trash Control Requirements

- ✓ 2015 Statewide Trash Amendments
- ✓ Require the **capture of all trash and debris larger than 5mm** from public storm drain system before 2030

2016 Pervious Concrete Gutter in El Rio Community



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El Rio Retrofit for Groundwater Recharge
Proyecto de El Rio para mejorar la recarga de aguas subterráneas

Key

- **A** Excess stormwater can cause flooding during rain events.
- **B** The pervious concrete captures at least 15,000 cubic feet (almost 6 Olympic size swimming pools) of stormwater within this project area during each rain event. More water is captured during long low-intensity rainfalls rather than during short high intensity events.
- **C** Stormwater captured by the pervious concrete helps to reduce flooding issues. Beneath the pervious concrete there is a 3-foot deep by 3-foot wide infiltration trench for effective capture of stormwater.
- **D** Captured stormwater is filtered and infiltrated for groundwater recharge.

Significado

- **A** Durante temporadas de lluvias, el exceso de aguas puede provocar inundaciones.
- **B** En el área de este proyecto, el hormigón de drenaje captura al menos 15,000 pies cúbicos (casi 6 piscinas de tamaño olímpico) de aguas pluviales durante temporadas de tormentas. Más agua es capturada durante las largas lluvias de baja intensidad que durante breves eventos de alta intensidad. Las aguas pluviales capturadas por este tipo de hormigón, ayuda a reducir problemas de inundaciones.
- **C** Debajo del este hormigón, existe una zanja de filtración de 3 pies de profundidad por 3 pies de ancho, que captura eficazmente las aguas pluviales.
- **D** Las aguas pluviales capturadas se filtran e infiltran para recargar las aguas subterráneas.

The El Rio Retrofit for Groundwater Recharge project includes approximately one mile of precast pervious concrete panels and subsurface infiltration trenches.

El proyecto de EL Rio, para mejorar la recarga de aguas subterráneas, incluye aproximadamente una milla de paneles de hormigón de drenaje prefabricados y zanjas de infiltración subterráneas.

http://uninc.vcstormwater.org/projects/el-rio-retrofit-for-groundwater-recharge

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Watershed Protection

Find Out More Online

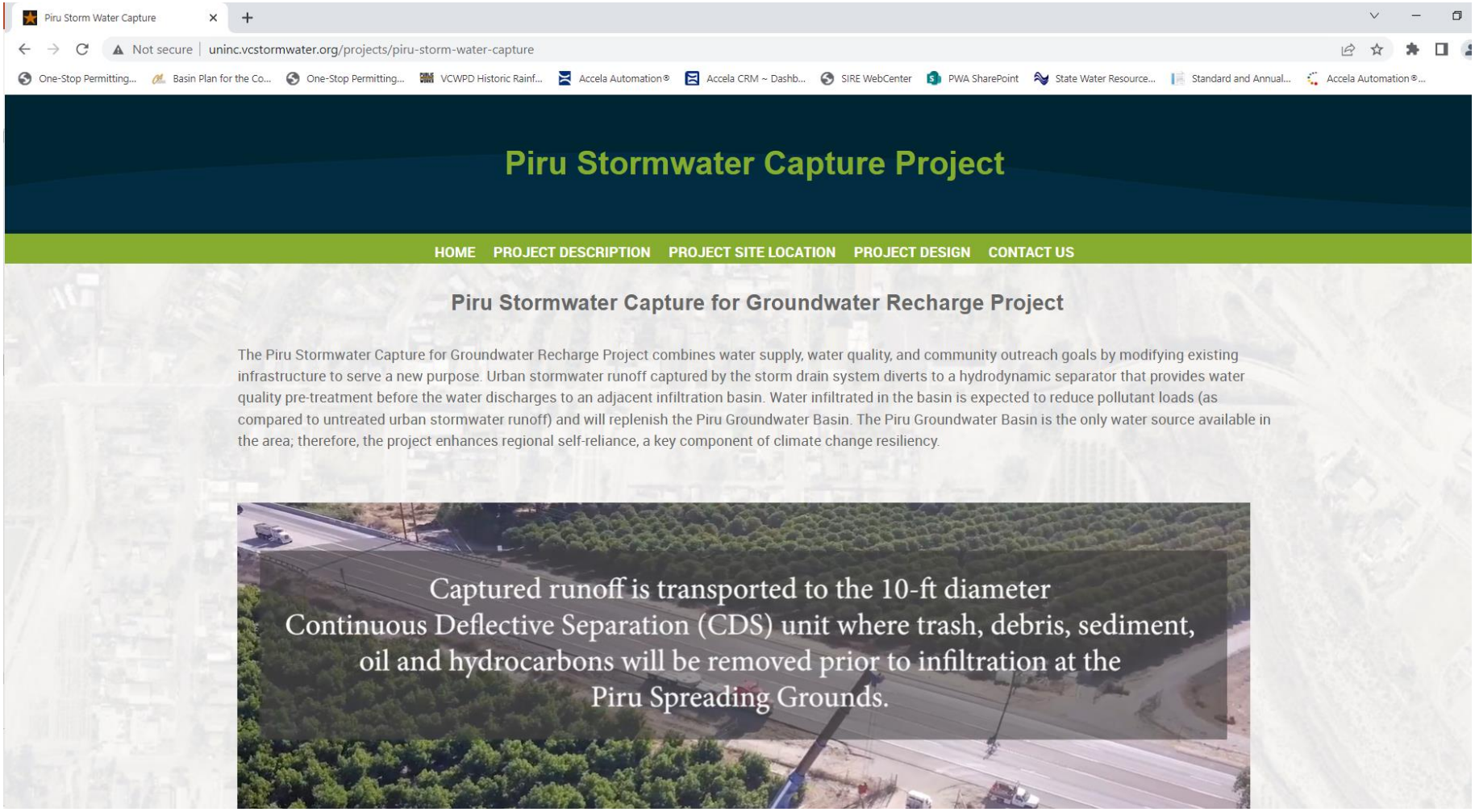
We invite you to visit
http://uninc.vcstormwater.org
for further information.

Para más información,
les invitamos que visiten al:
http://uninc.vcstormwater.org

This project was financed under the Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006, administered by State of California, Department of Water Resources.

Este proyecto fue financiado mediante Segura Agua Potable, Calidad y Suministro del Agua, Control de Inundaciones, Protección de Ríos y Costa Bono Acto del 2006, Administrado por el Estado de California, Departamento de Recursos del Agua.

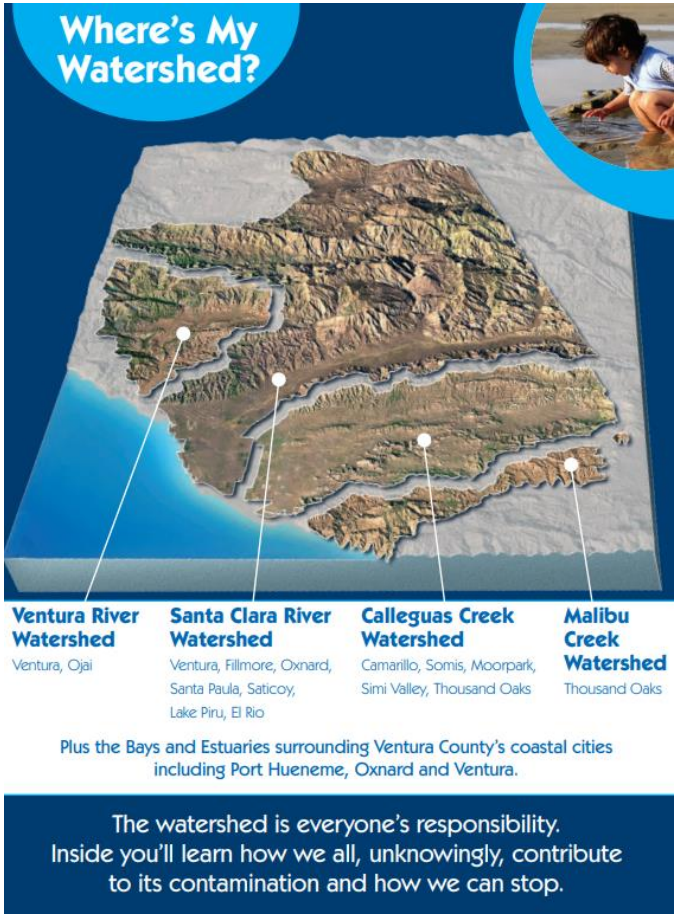
2020 Stormwater Capture in Piru Spreading Grounds



http://uninc.vcstormwater.org/projects/piru-storm-water-capture

2023 Santa Clara River Watershed Management Program

- ✓ Strategies, control measures, and BMPs
- ✓ Regional Stormwater Mitigation BMPs
- ✓ Stormwater capture and groundwater recharge projects
- ✓ Due September 11, 2023

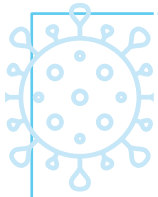


Feasibility Study Purpose

Reduce pollution in stormwater runoff in El Rio community in Ventura County

Alleviate flooding

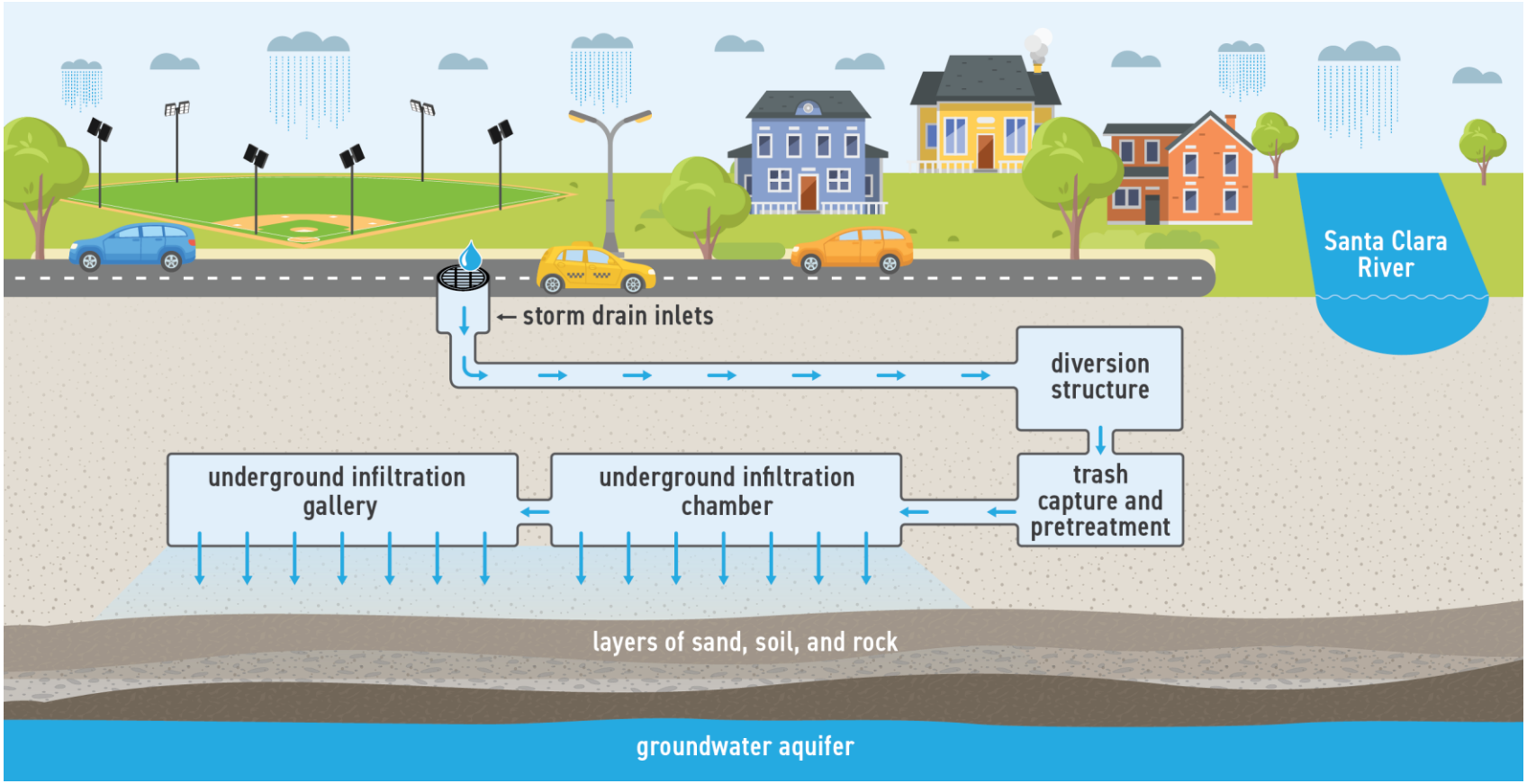
Improve water quality in Santa Clara River Watershed



Meet Bacterial TMDL requirements

Meet requirements of Trash Amendments

Stormwater Capture and Groundwater Recharge Project Concept

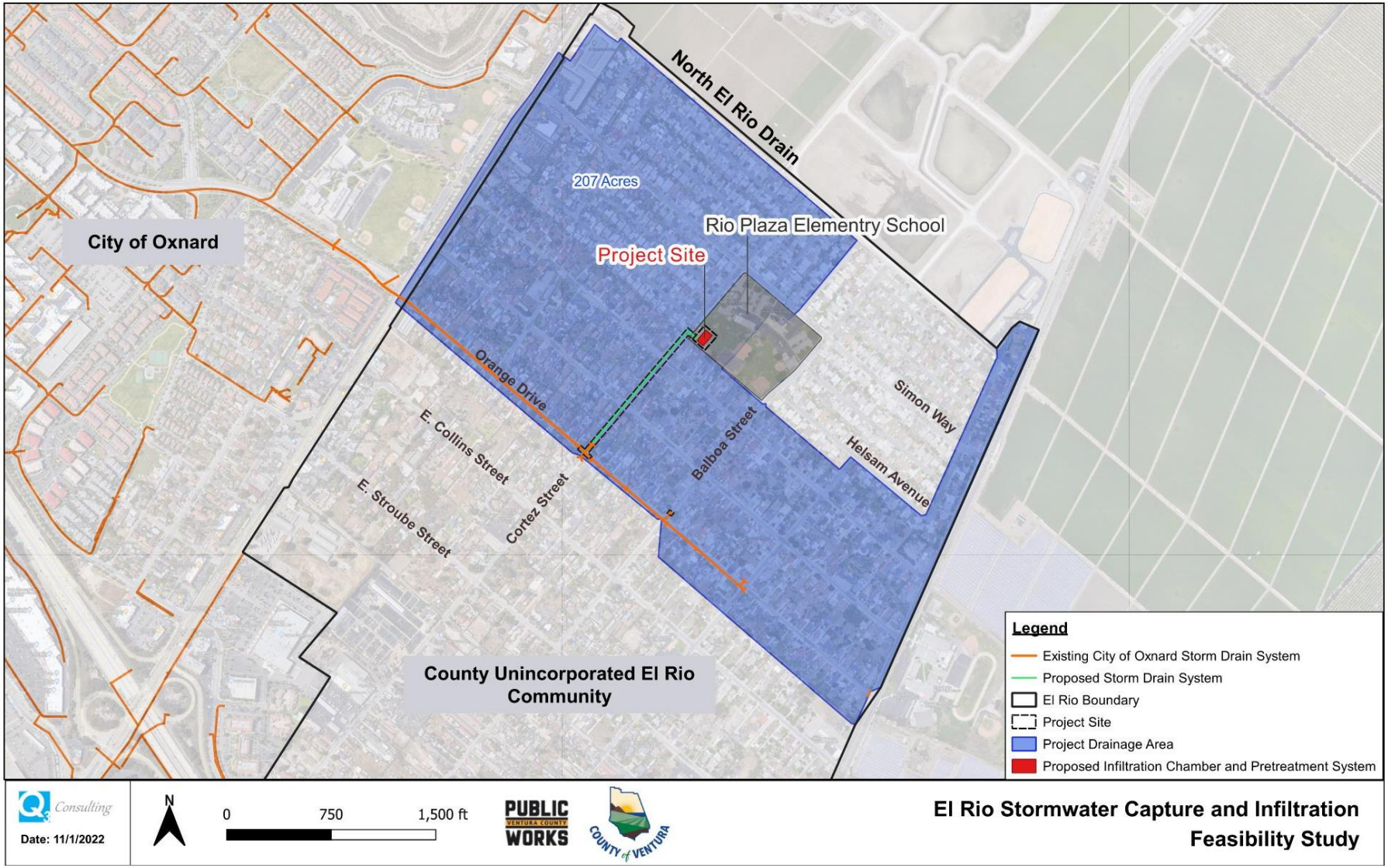


2022 El Rio Stormwater Capture Feasibility Study

- ✓ Proposition 1 Disadvantaged Community (DAC) Grant Program
- ✓ Stormwater capture for groundwater recharge in County unincorporated community of El Rio
- ✓ Feasibility study and 30% design
- ✓ Future grant funding will be needed for construction

- ✓ Future funding will be needed for long-term O&M

El Rio Stormwater Capture Feasibility Study Location



El Rio Stormwater Capture Feasibility Study Description

- ✓ El Rio treatment area: 207 acres
- ✓ Estimated 78 acre-feet of captured stormwater per year
- ✓ Underground infiltration chamber under baseball field at Rio Plaza Elementary School
- ✓ Trash capture device and runoff pretreatment controls
- ✓ Improvements to storm drain along Cortez Street

Underground Infiltration Chamber

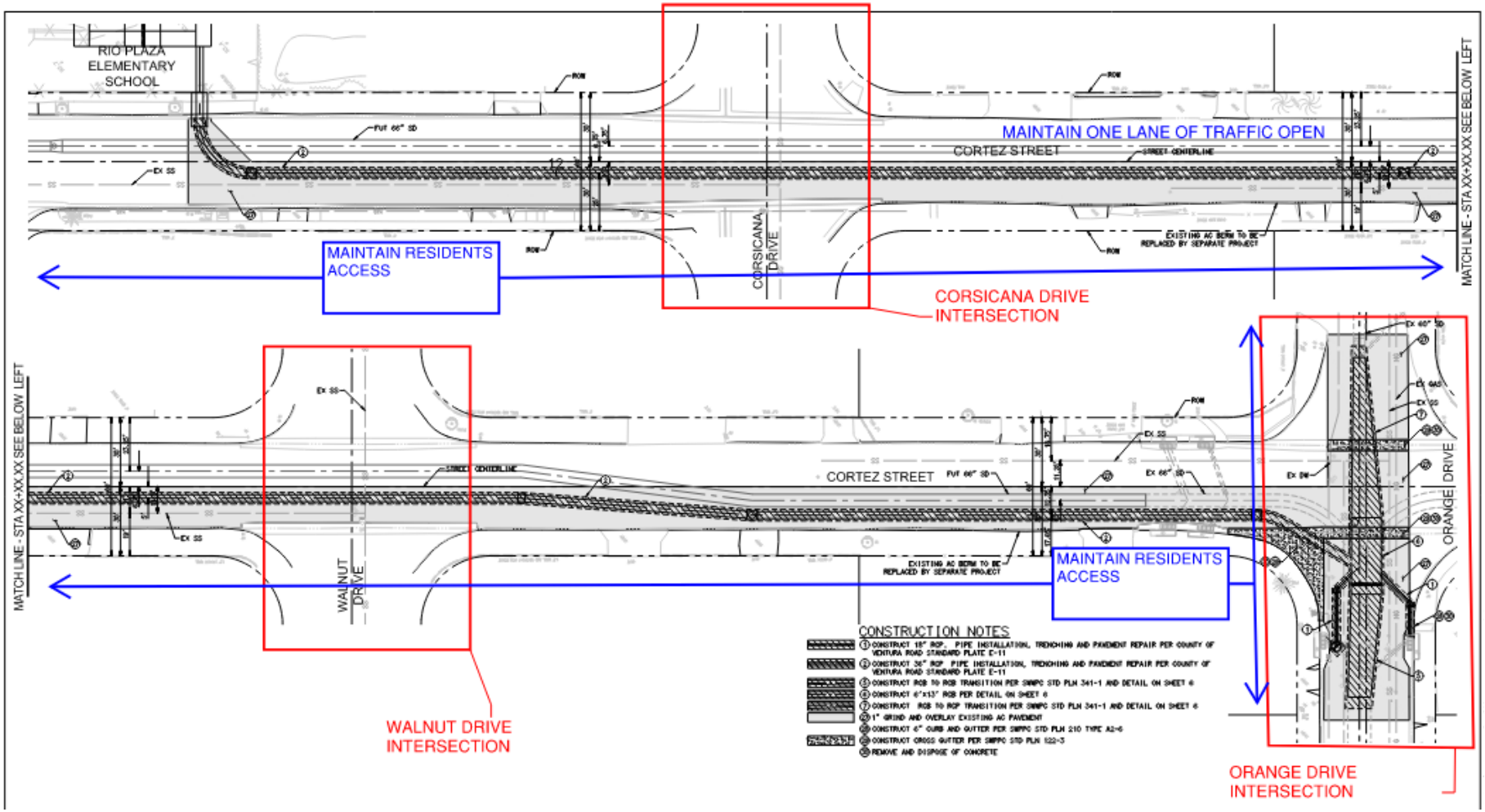
El Rio Stormwater Capture
Proposed Project Benefits

- ✓ Significant reduction of flooding in El Rio streets
- ✓ Sustainable source of groundwater recharge
- ✓ Bacteria TMDL Compliance
- ✓ Compliance with State Trash Control Requirements
- ✓ Educational opportunities at Rio Plaza Elementary School and Community

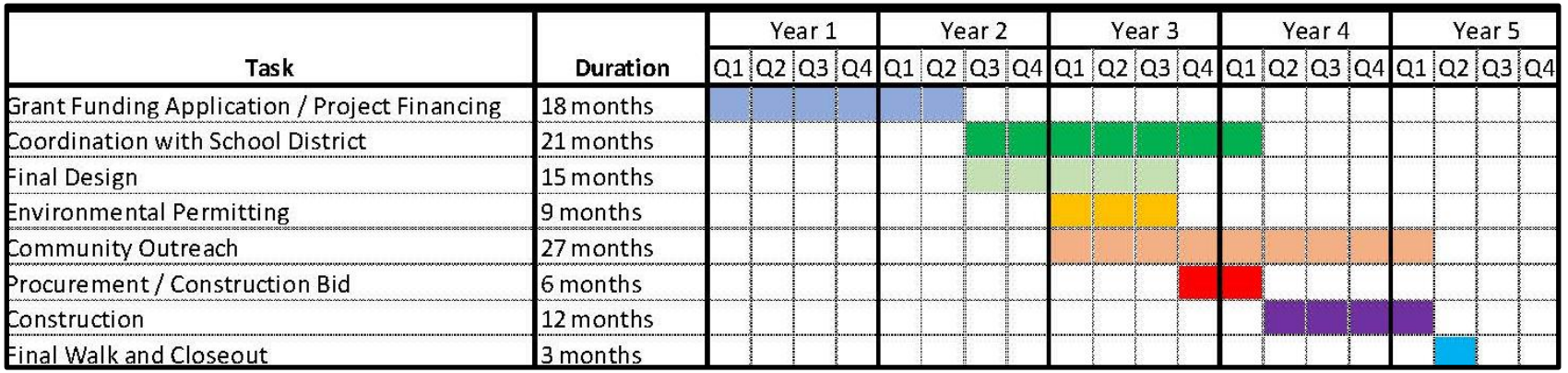
El Rio Stormwater Capture Construction Considerations

- ✓ Installation of underground infiltration chamber (11,000 sq. ft. subsurface) and pre-treatment device at Rio Plaza Elementary School – about 0.5 acre of soil temporary disturbance
- ✓ Installation of new storm drain piping and inlets (1,200 linear feet)
- ✓ Rebuilding of baseball/softball field at the at Rio Plaza Elementary School
- ✓ Est. full construction cost $9.3M
- ✓ Est. O&M cost $52,000 per year

El Rio Stormwater Capture Construction Traffic



El Rio Stormwater Capture Schedule and Next Steps



Task	Duration	Year 1				Year 2				Year 3				Year 4				Year 5			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Grant Funding Application / Project Financing	18 months																				
Coordination with School District	21 months																				
Final Design	15 months																				
Environmental Permitting	9 months																				
Community Outreach	27 months																				
Procurement / Construction Bid	6 months																				
Construction	12 months																				
Final Walk and Closeout	3 months																				

PUBLIC VENTURA COUNTY WORKS

Questions?

Project Contact

Ewelina Mutkowska, Manager
County Stormwater Program
(805) 645-1382
Ewelina.Mutkowska@ventura.org

Visit our website:

http://uninc.vcstormwater.org/projects/el-rio-stormwater-capture

Appendix D

Public Outreach Brochure (English and Spanish), Prepared by Rincon Consultants, Inc.

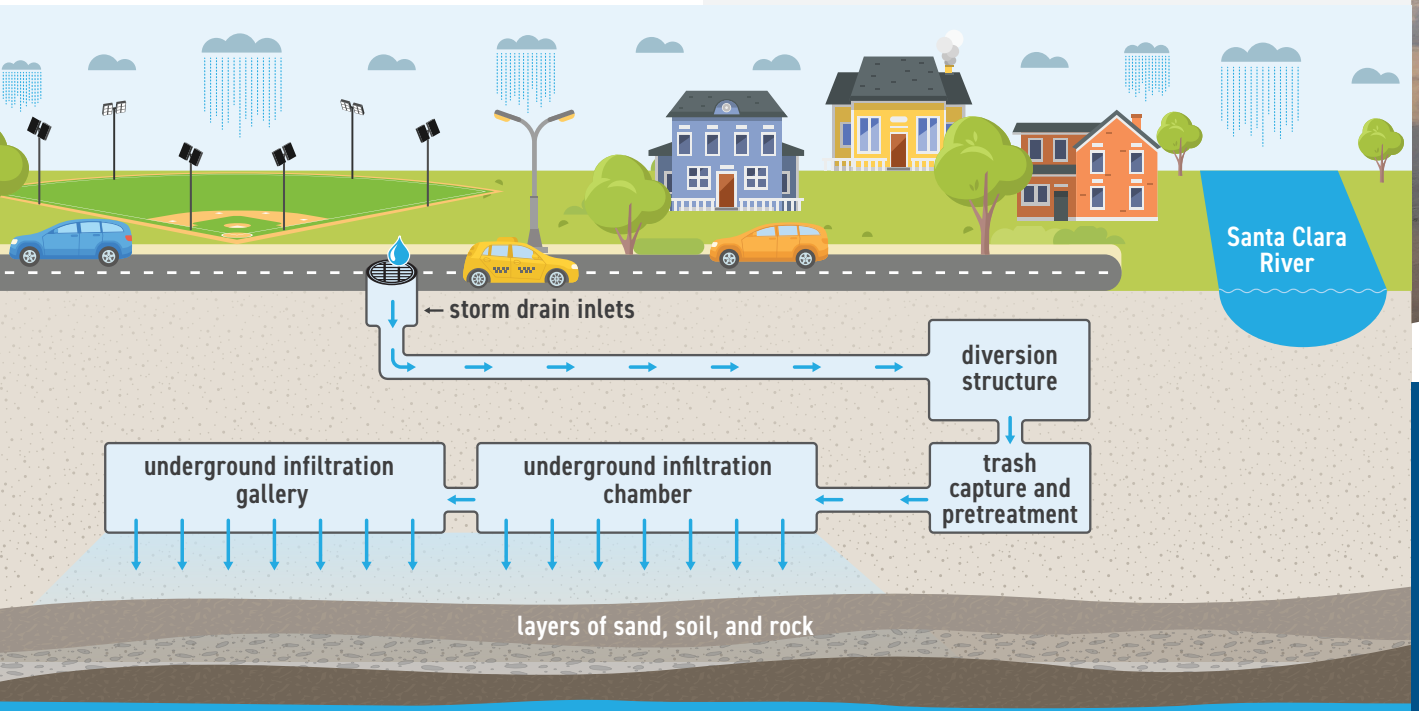
Stormwater capture and groundwater recharge projects help the community:

- Recharge the underlying groundwater aquifer
- Enhance local water supply
- Alleviate flooding
- Reduce pollution in stormwater runoff
- Improve water quality in the Santa Clara River
- Meet California trash control requirements
- Meet Bacterial TMDL[1] requirements

[1]TMDL = Total Maximum Daily Load, the calculation of the maximum amount of a pollutant allowed to enter a waterbody so that the waterbody will meet water quality standards for that pollutant.

How can you help?

- Use drought-tolerant plants to reduce landscape water needs
- Always pick up after your pets
- Install a rain barrel to capture stormwater on your property
- Participate in local beach and riverbank clean-ups
- Eliminate water waste
- Always keep trash and litter inside closed containers



EL RIO AND SATICOY PARK
Stormwater Capture Feasibility Studies

PUBLIC WORKS
VENTURA COUNTY

To Learn More

Project Contact:
Ewelina Mutkowska,
Senior Stormwater Manager
Ewelina.Mutkowska@ventura.org

Learn more at
https://uninc.vcstormwater.org/

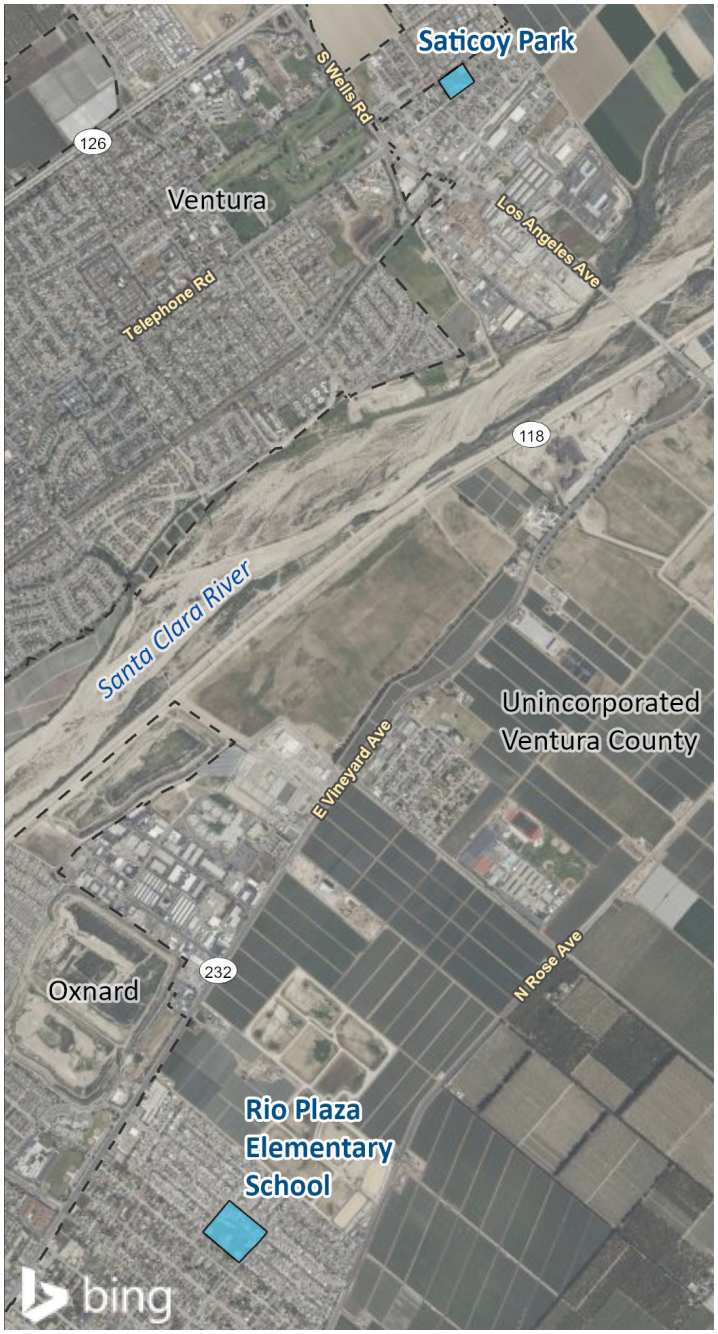
El Rio

Stormwater Capture and Groundwater Recharge Project

- 78 acre-feet of captured stormwater per year
- Allevate flooding across 207 acres in the El Rio community
- Underground stormwater capture and infiltration under the baseball field at Rio Plaza Elementary School
- Upgrade of the school's baseball field
- Water quality improvement in the Santa Clara River
- Compliance with the Federal Clean Water Act
- Improvements to storm drains along Cortez Street in El Rio

El Rio and Saticoy

Project Sites



Saticoy Park

Stormwater Capture and Groundwater Recharge Project

- 57 acre-feet of captured stormwater per year
- Underground stormwater capture and infiltration under the baseball field at Saticoy Park
- Opportunity to collaborate on the baseball field and park upgrades
- Water quality improvement in the Santa Clara River
- Compliance with the Federal Clean Water Act
- Reduce stormwater flows in Brown Barranca to mitigate flooding in the Saticoy Community

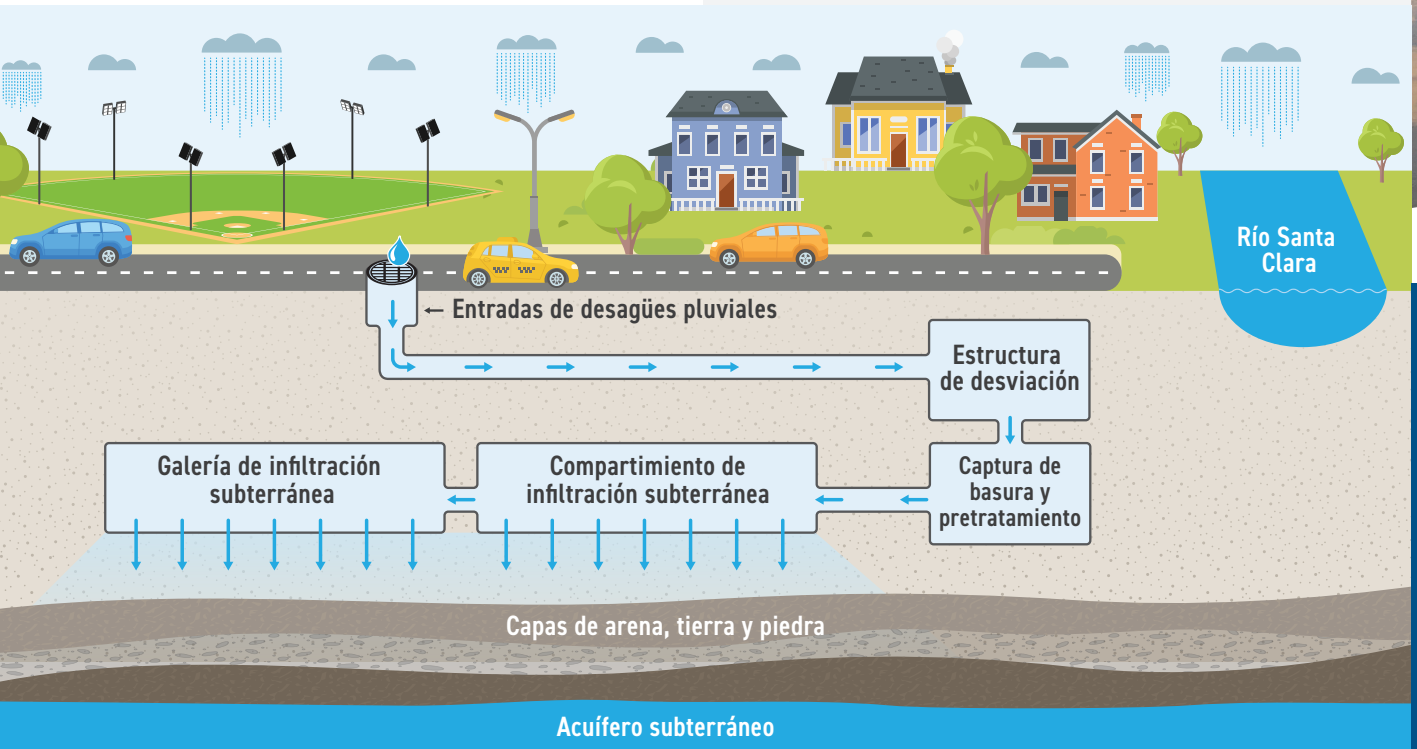
Los proyectos de captura de aguas pluviales y recarga de aguas subterráneas ayudan a la comunidad:

- Recargar el acuífero subterráneo subyacente
- Mejorar el suministro local de agua
- Aliviar las inundaciones
- Reducir la contaminación en la escorrentía de aguas pluviales
- Mejorar la calidad del agua en el río Santa Clara
- Cumplir con los requisitos de control de basura de California
- Cumplir con los requisitos de TMDL[1] bacterianas

[1]TMDL = Carga Diaria Máxima Total (Total Maximum Daily Load en inglés), significa el cálculo de la cantidad máxima de un contaminante permitido para entrar en un cuerpo de agua para que el cuerpo de agua cumpla y continúe cumpliendo con los estándares de calidad del agua para ese contaminante

¿Cómo puede ayudar?

- Use plantas tolerantes a la sequía para reducir las necesida de agua de su paisajismo
- Instale un barril de lluvia para capturar las aguas pluviales en su propiedad
- Capturar las aguas pluviales en su propiedad
- Siempre recoge después de tus mascotas
- Participar en limpiezas de playas y ríos
- Mantenga siempre la basura dentro de contenedores cerrados



EL RIO Y PARQUE SATICOY

Estudios de Viabilidad de Captura de Aguas Pluviales

PUBLIC WORKS
VENTURA COUNTY

Para Obtener Más Información

Contacto del proyecto:
Ewelina Mutkowska,
Gerente Senior de Aguas Pluviales
Ewelina.Mutkowska@ventura.org

Mantenga siempre la basura dentro de contenedores cerrados:
https://uninc.vcstormwater.org/

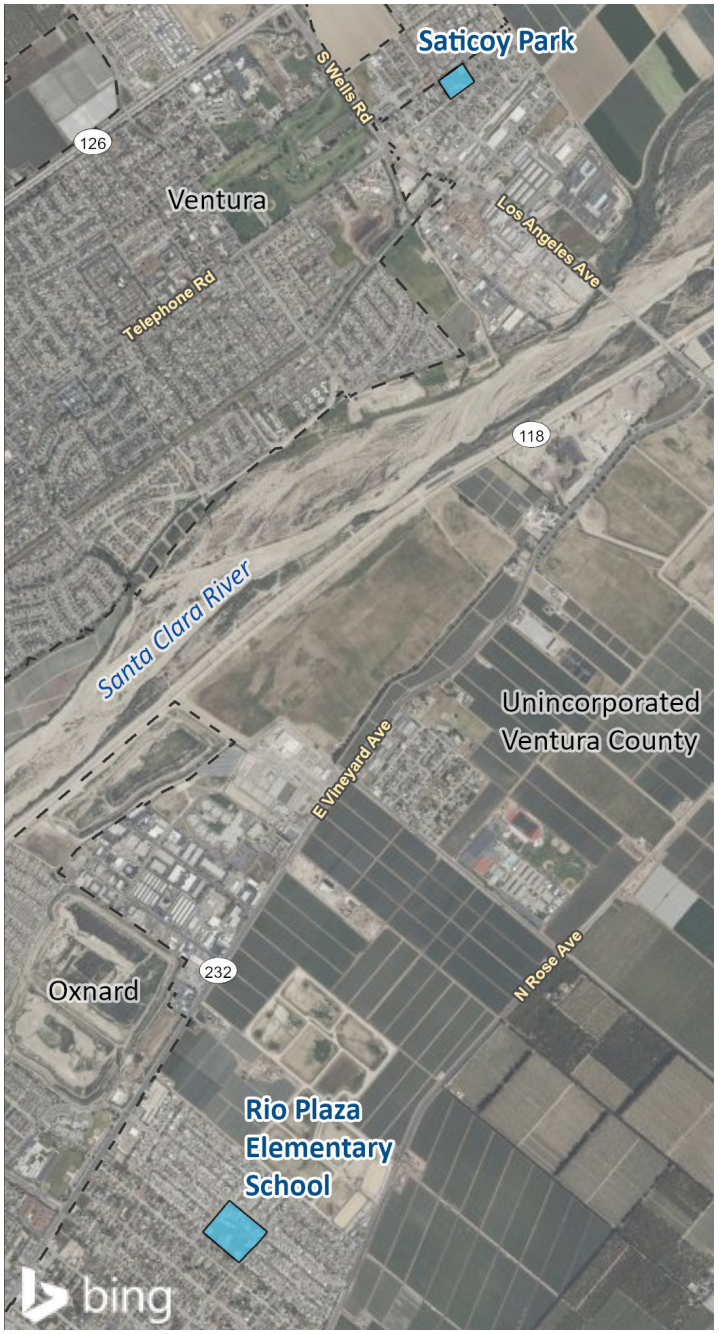
El Rio

Proyecto de Captura de Aguas Pluviales y Recarga de Aguas Subterráneas

- 78 acres-pies de aguas pluviales capturadas por año
- Aliviar las inundaciones en 207 acres en la comunidad de El Río
- Captura de infiltración subterránea de aguas pluviales debajo del campo de béisbol en la escuela primaria Rio Plaza
- Mejora del campo de béisbol de la escuela
- Mejora de la calidad del agua en el río Santa Clara
- Cumplimiento de la Ley Federal de Agua Limpia
- Mejoras a los desagües pluviales a lo largo de la calle Cortez en El Río

El Rio y Saticoy

Sitios del Proyecto



Parque Saticoy

Estudio de Viabilidad de Captura de Aguas Pluviales

- 57 acre-pies de aguas pluviales capturadas por año
- Captura de infiltración subterránea de aguas pluviales debajo del campo de béisbol en el parque Saticoy
- Oportunidad de colaborar en las mejoras del campo de béisbol y del parque
- Mejora de la calidad del agua en el río Santa Clara
- Cumplimiento de la Ley Federal de Agua Limpia
- Reducir los flujos de aguas pluviales en Brown Barranca para mitigar las inundaciones en la comunidad de Saticoy

Appendix E

Project Website, Prepared by theAgency, Inc.
Available at
http://uninc.vcstormwater.org/projects/stormwater-capture-studies/el-rio-stormwater-capture