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City of Redding
Stormwater Resource Plan

Stakeholder Kickoff Meeting

January 11, 2018

Discussion Topics

- Stormwater Resource Plan (SWRP) project goals
- SWRP project collaboration
- Identification and Prioritization of Projects
- Wrap up

Stormwater Resource Plan
Project Goals

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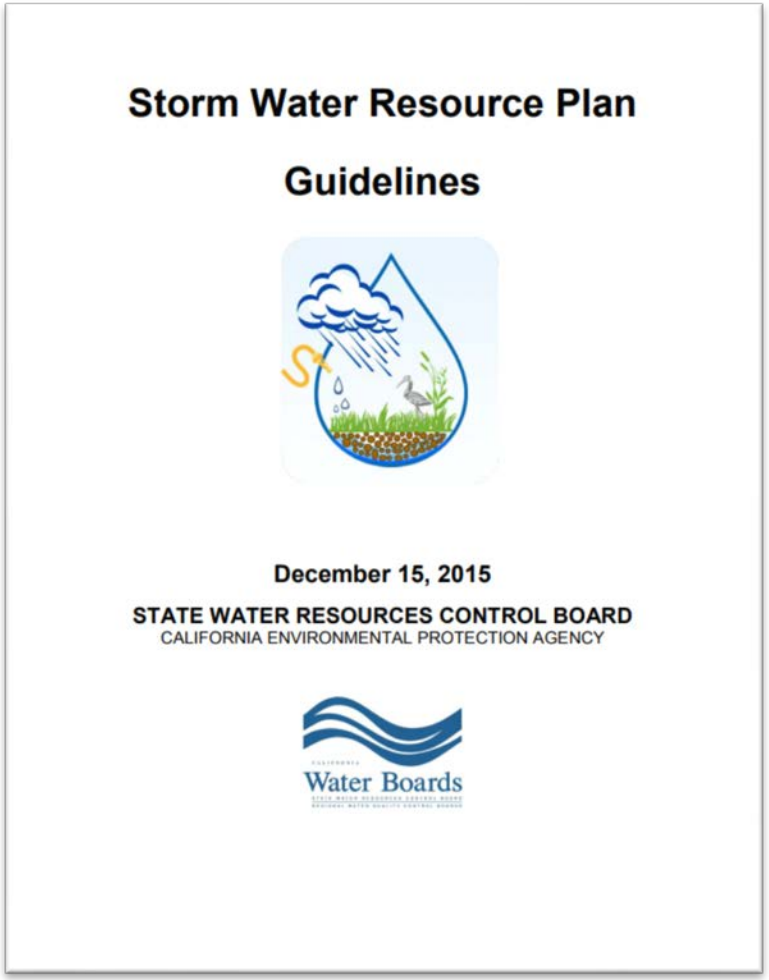
SWRP Background

- Senate Bill (SB) 985, the Stormwater Resources Planning Act
  - requires development of a Storm Water Resource Plan to receive grant funds
- The Water Quality, Supply, and Infrastructure Improvement Act (Proposition 1)
  - provides $200 million for matching grants



SWRP Requirements

- Identify watershed and subwatersheds
- Identify pollutant sources
- Consistent with other plans and permits
- Prioritize project based on multiple benefits
- Community participation
- Submit to Integrated Regional Water Management (IRWM) Group

TABLE 3. BENEFIT METRICS

Benefit	Example	Metric Unit(s)
Water Quality *while contributing to compliance with applicable permit and/or TMDL requirements*	Increased filtration and/or treatment of runoff	**Pollutant Load Reduction** pounds (lbs)/day kilograms (kg)/day milligram/Liter microgram /Liter most probable number of bacteria or indicator organisms (mpn)/mL **Volume Treated** million gallons per day (mgd) acre-feet per year (afy)
	Nonpoint source pollution control	
	Reestablished natural water drainage and treatment	
Water Supply *through groundwater management and/or runoff capture and use.*[11]	Water supply reliability	**Volume Captured** *in terms of augmentation/replacement of water supply, or reduced dependence on imported water* million gallons per day (mgd) acre-feet per year (afy) **Cost** dollars per volume per year (of augmented water supply)
	Water conservation	
	Conjunctive use	
Flood Management	Decreased flood risk by reducing runoff rate and/or volume	**Rate, Volume, and/or Size** cubic feet per second (cfs) acre-feet (af) cubic feet (cf) acres or linear feet
	Reduced sanitary sewer overflows	
Environmental	Environmental and habitat protection and improvement, including: - wetland enhancement/creation; - riparian enhancement; and/or - instream flow improvement	**Size and/or Rate** acres cubic feet per second (cfs) carbon sequestration (megagrams of carbon per area)
Environmental ***(continued)***	Increased urban green space	**Other**[12] area units of landscape and buffer measure of improved hydrology number of biotic structure number of physical structures reduced temperature (degrees)
	Reduced energy use, greenhouse gas emissions, or provides a carbon sink	
	Reestablishment of the natural hydrograph	
	Water temperature improvements	
Community	Enhanced and/or created recreational and public use areas	**Size** size of population served number of people number of jobs acres
	Community involvement	
	Employment opportunities provided	

Primary Goals and Mission

Develop a forward-thinking SWRP that includes:

- Prioritizing water quality concerns
- Community education
- Identification of projects that bring value and benefit to the community
- Collaborative development
- Local project support
- Opportunities for future grant funding

The End Product

Prepared for

CITY OF REDDING CALIFORNIA

Draft - Stormwater Resource Plan

Redding, CA

Prepared by

Geosyntec consultants

engineers | scientists | innovators

924 Anacapa Street, Suite 4A
Santa Barbara, CA 93101

Geosyntec Project Number: LA0443

June 2018

- SWRP meeting all Water Code requirements and SWRP guideline recommendations
- Living plan that you can update in the future
- Carefully screened and prioritized parcels
- Project concepts ranked by multi-benefits

Example Project – Natural Treatment System

Example Project – Natural Treatment System

Example Projects – Creek Restoration

Stormwater Resource Plan
Project Collaboration

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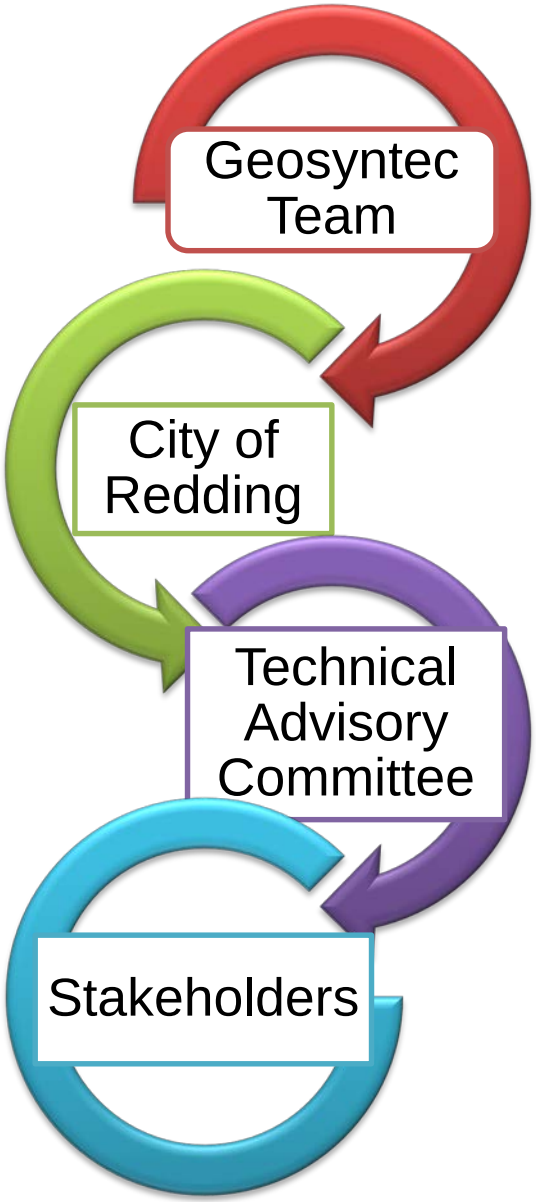
Project Collaboration



- Develop SWRP
- Identify, design, model, & prioritize projects based on SWRP Guidelines and local priorities

- Manage SWRP development & State Grant Agreement
- Coordinate collaboration of stakeholders, TAC, and consultants

- Oversee & review SWRP development
- Direct project design & modeling priorities
- Engage with local stakeholders

- Provide local insight & feedback during SWRP development
- Recommend potential projects
- Comment on the public draft SWRP

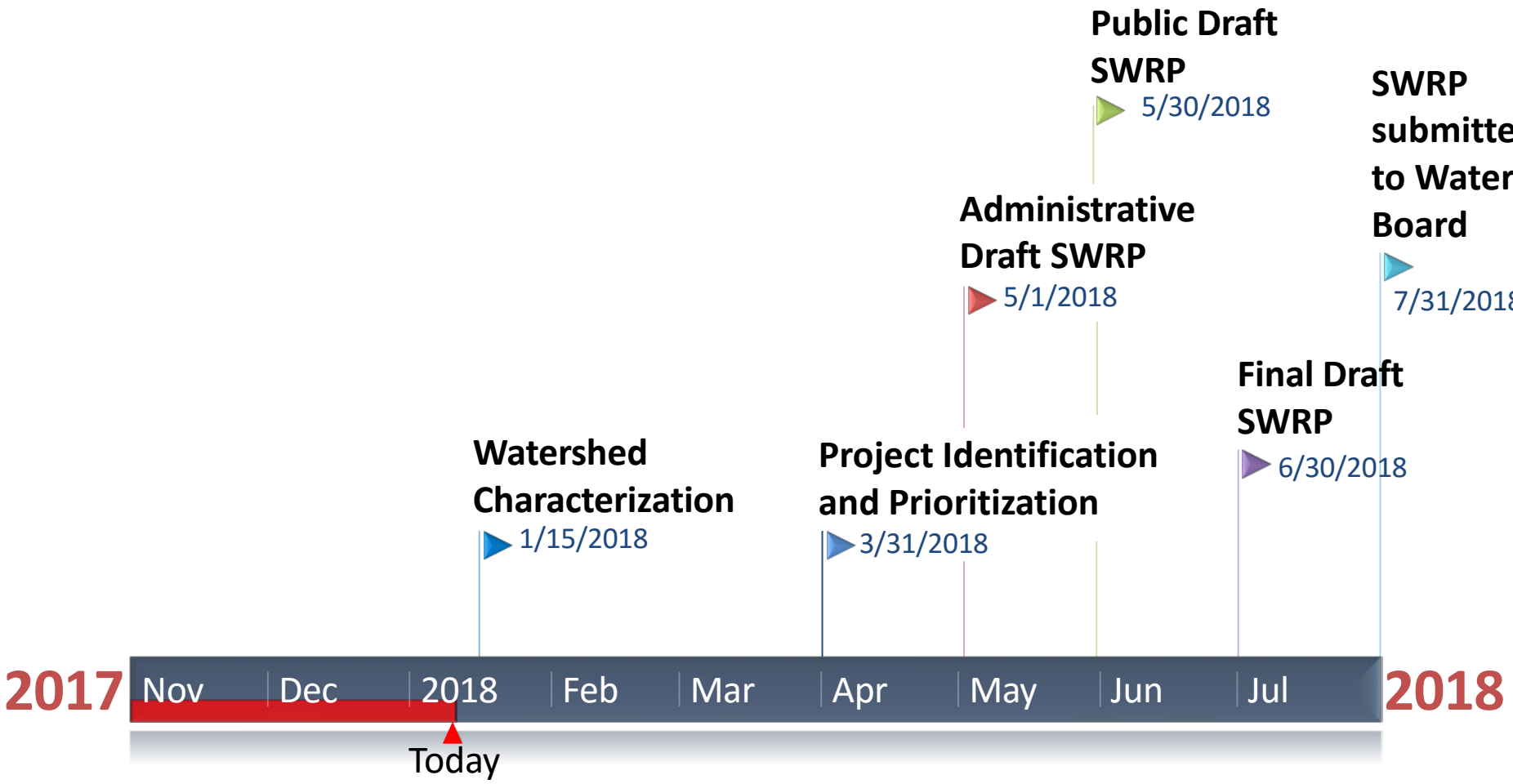
TAC Members

Affiliation	Primary Contact
Water Utility	Josh Watkins
Storm Drain Utility	Marty Wayne
Parks & Recreation	Joe Forseth-Deshais
Streets Department	Randy Campbell
Water Conservation	Jaclyn Kong
Planning	Paul Hellman
Storm Water Management	Jon Oldham

Stakeholder Meetings

- 1st Stakeholder Meeting – Week of 1/9/18
  - Project overview
  - Present draft parcel screening and prioritization
  - Request other potential locations/projects for consideration
- 2nd Stakeholder Meeting – March 2018
  - Present draft conceptual projects and benefit prioritization
  - Request other potential projects for inclusion
- 3rd Stakeholder Meeting – June 2018
  - Present public draft SWRP

Project Milestones



Identification and Prioritization of Projects

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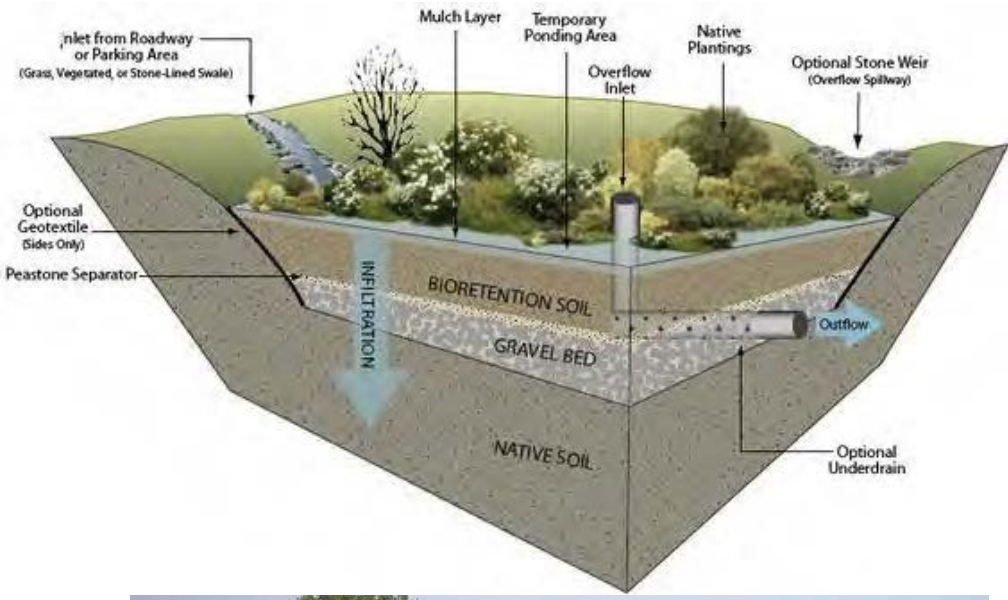
Project Types – Natural Treatment Systems

- **Benefits**
  - Cost effective
  - Pollutant removal
  - Recharge groundwater
  - Aesthetic improvements
- **Constraints**
  - Poor infiltrative soils
  - Significant space requirements

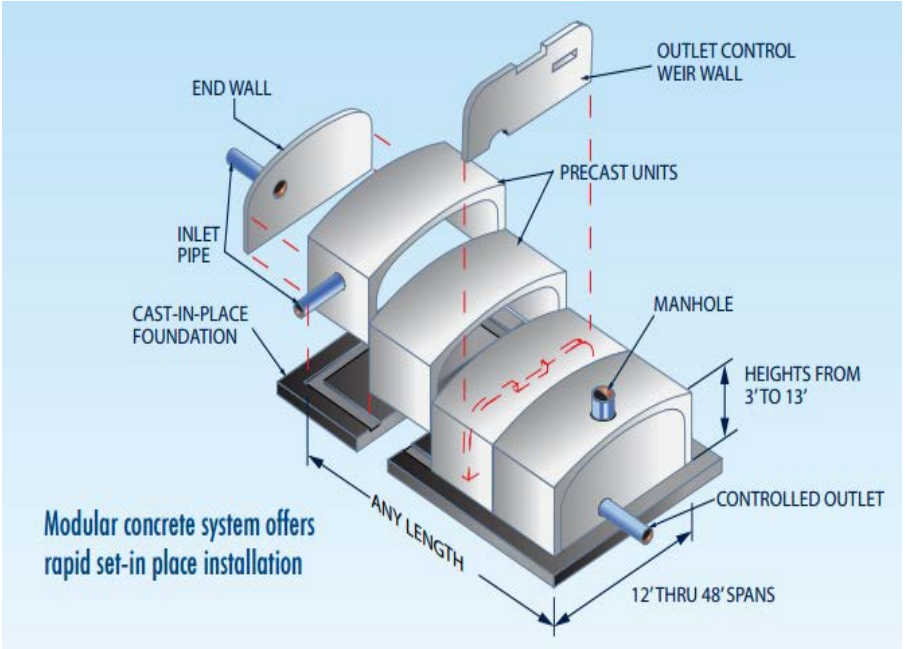


Project Types – Green Streets

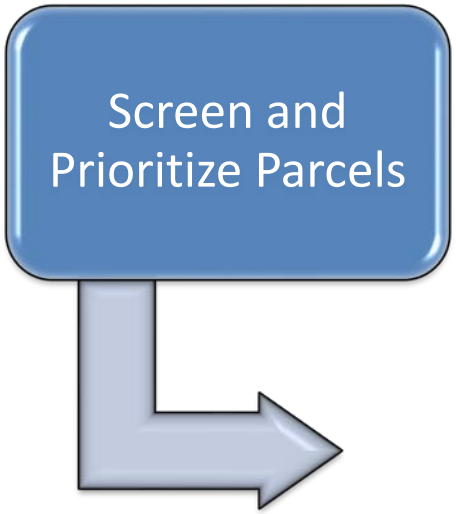
- Benefits
  - High pollutant concentration removal
  - Community greening
  - Combined with planned street improvements
- Constraints
  - Space limited
  - Expensive to install

Project Types – Direct Use

- Benefits
  - Off-set potable water demand
  - Pollutant removal
  - Minimal footprint and installation constraints
- Constraints
  - Expensive to install, operate, and maintain
  - Need ongoing demand for water captured



Project Identification and Prioritization Approach



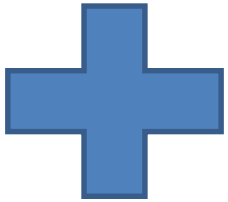
- 35,663 total parcels in the city
- 434 feasible parcels
- 3,927 feasible green streets
- 25 recommended parcels

Parcel Screening Results

Stakeholder Identified Projects

General Project Details

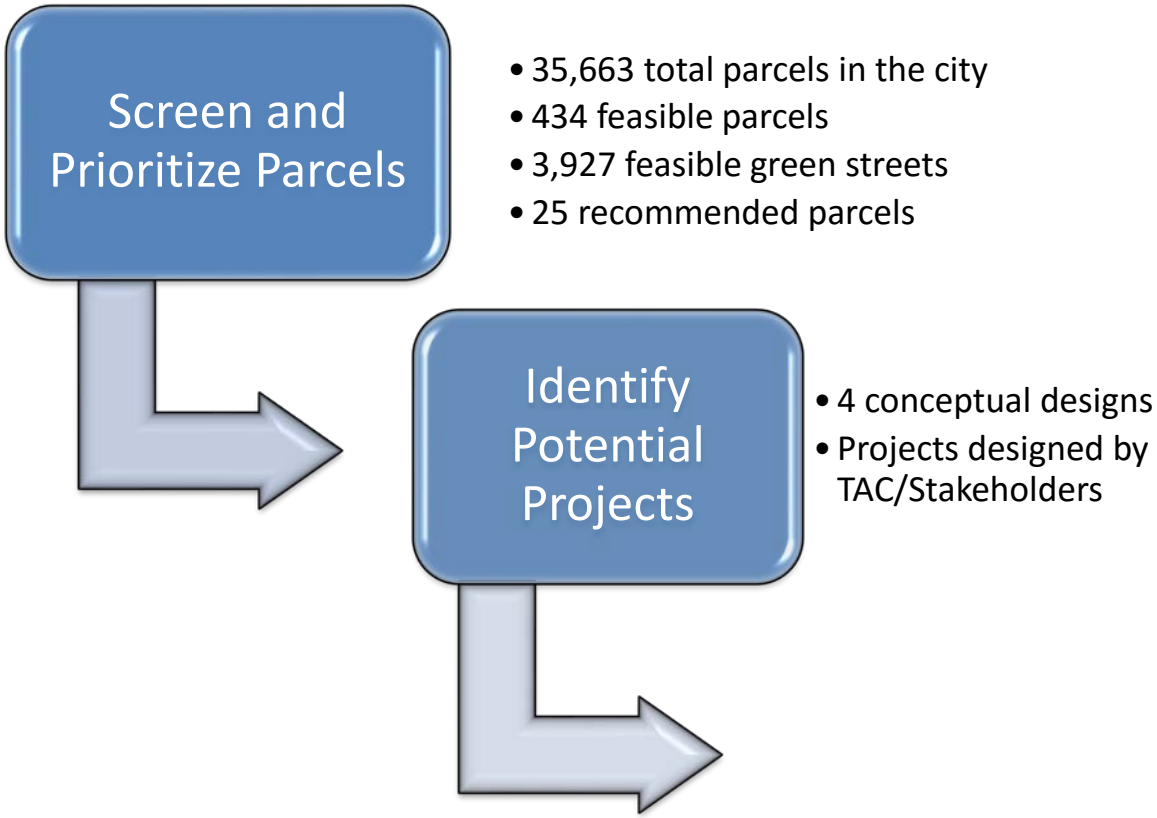
ID	Project Name	Proposed By	Public/ Private Parcel	Specific Location (Coor.)	Watershed	Project Description (Type)	Multiple Benefits (None, Med, High)					Notes
							Water Quality	Water Supply	Flood Management	Environmental	Community	



Conceptual Project Designs

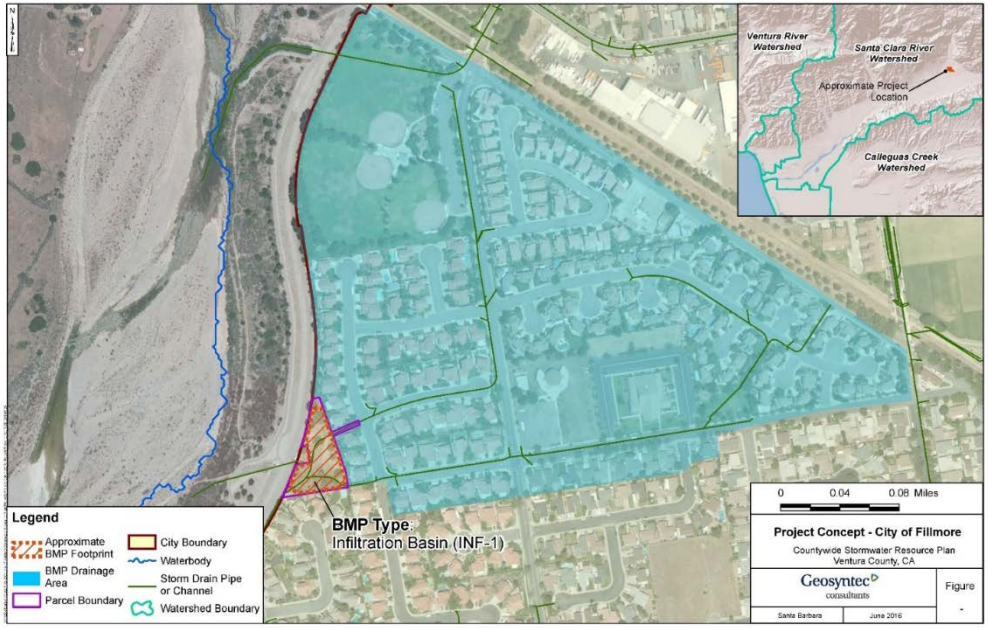
Catchment	Acres of Land Use in BMP treatment area	Average Annual Percent Capture	Infiltration rate (in/hr)	Discharge rate (cfs)	BMP Depth (ft)	BMP storage capacity (cu ft)

Project Identification and Prioritization Approach



Conceptual Project Development

- For up to 4 projects
  - Identify ownership, project area, and pretreatment area
  - Delineate upstream drainage area
  - Determine conceptual design parameters (e.g., side slopes, depth, storage volume)



Project Identification and Prioritization Approach

Screen and Prioritize Parcels

- 35,663 total parcels in the city
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Identify Potential Projects

- 4 conceptual designs
- Projects designed by TAC/Stakeholders

Quantify Multiple Benefits

- Pollutant Reductions
- Groundwater Recharge
- Runoff Volume Remove
- Habitat Created

Conceptual Project Development – Template Sheet 1

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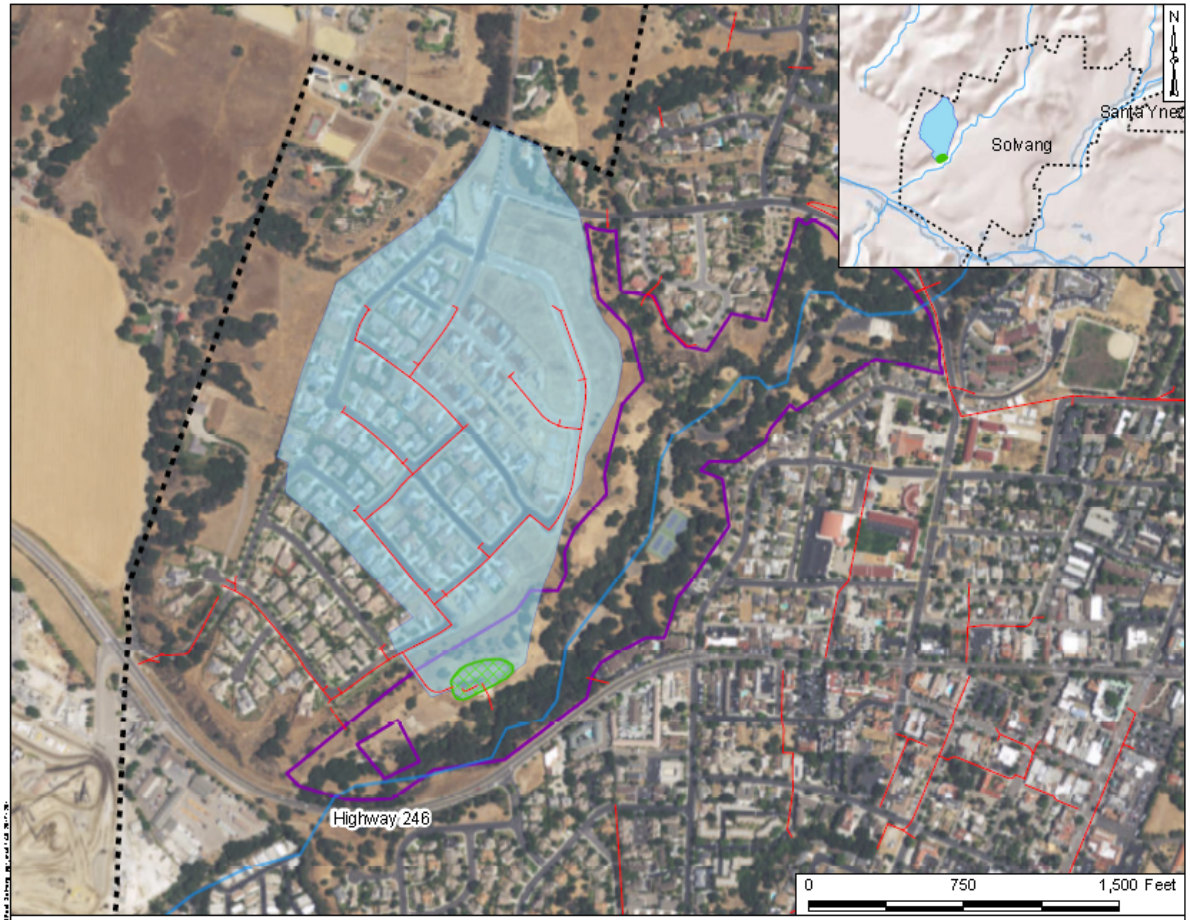


Project Description

This project plans to revitalize existing stormwater infrastructure to allow for water quality treatment and recharge of groundwater. An existing detention basin is located at the southern end of Hans Christian Andersen Park located adjacent to the Skytt Mesa housing development. The proposed site receives stormwater from a 60-inch storm drain which collects runoff from a primarily residential, 64 acre drainage area. The existing detention basin will be deepened and expanded into an infiltration basin designed to store 140,000 cu-ft. The existing detention basin is owned and operated by the City of Solvang, and there is currently a Lighting and Landscape Maintenance Division (LLMD) in place for the residential neighborhood that includes maintenance of the basin.

Potential Site Constraints:

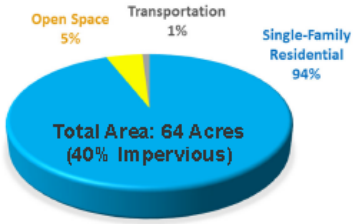
Vegetation in the basin area should be inspected prior to finalizing the project design to confirm no oak or other protected species are present.

Example Infiltration Basin (proposed concept)

Legend

- Waterbody
- Storm Drain
- BMP Drainage Area
- BMP Footprint
- Parcel Boundary
- City/County Unincorporated

Project Drainage Area



Project Overview

Parcel Ownership	City of Solvang
APN	137-670-001
Soil Type	Hydrologic Soil Group A
Watershed	Santa Ynez
Groundwater Basin	Santa Ynez River Valley
Jurisdiction(s)	City of Solvang

Note: Proposed project is conceptual and subject to change based on future feasibility assessment, funding availability, and/or other information.

Infiltration Basin Project Concept
Hans Christian Andersen Park
City of Solvang

Santa Barbara County-wide
Integrated Stormwater Resource Plan

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Figure 7a

Conceptual Project Development – Template Sheet 2

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Legend

- Waterbody
- Storm Drain
- Flow Diversion
- BMP Footprint
- Parcel Boundary
- Direction of Flow

Note: Proposed project is conceptual and subject to change based on future feasibility assessment, funding availability, and/or other information.

Project Design Information

BMP Type	Infiltration Basin
Total Project Footprint	1.1 acres (includes 12,000 sq ft pretreatment)
Depth	5.0 ft (includes 1 ft freeboard)
Storage Volume	3.2 ac-ft
Assumed Infiltration Rate	1.0 in/hr
Stormwater Source	60 inch RCP storm drain owned by City of Solvang

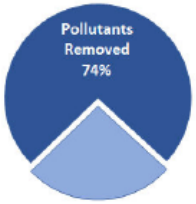
Project Benefits

All benefits are expressed as an average annual estimate based on historical modeling.

Water Quality:

Drainage Area Pollutant Reductions	
TSS (lbs)	9,700
NO3 (lbs)	61
Dissolved Cu (lbs)	0.74
Fecal Coliform (MPN)	5.4

State impaired water list identified these pollutants as elevated in the receiving waters.



Water Supply:

Recharged Groundwater Volume
19 acre-feet

Equivalent Households Supplied

Flood Management: 29 acre-feet (74%) of runoff will be removed annually from the stormdrain system. All of the runoff generated from an 85th percentile 24-hr storm will be captured and infiltrated.

Environmental Enhancements: Infiltrated water will enhance the park greenspace and promote vegetation, increasing the habitat value.

Community Enhancements: Signage to educate public about the projects multiple benefits; and native vegetation and landscaping will improve the aesthetics of the parcel.

Design Criteria

	85th Percentile, 24-hr Storm	Long-Term Average Annual
Precipitation (in)	1.18	16.8
Runoff Volume (ac-ft)	2.7	39
Percent of Runoff Volume Captured (%)	**>100**	**74**
Total Volume Captured (ac-ft)	**2.7**	**29**

Infiltration Basin Project Concept
Hans Christian Andersen Park
City of Solvang

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Figure 7b

Project Identification and Prioritization Approach

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Quantify Multiple Benefits

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- Habitat Created

Prioritize Projects

- Multiple Benefits
- Willing Land Owner
- Commitment to Maintenance

Wrap up

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Primary Goals and Mission

Develop a forward-thinking SWRP that includes:

- Prioritizing water quality concerns
- Community education
- Identification of projects that bring value and benefit to the community
- Collaborative development
- Local project support
- Opportunities for future grant funding

Stakeholder Roles and Responsibilities

- Attend Stakeholder meetings
- Provide input into development of the SWRP and projects
- Recommend potential projects
- Comment on the public draft SWRP
- Provide letters of support for the conceptual projects

Stakeholder Actions Needed

- Provide projects for desktop evaluation (1/18)
- Next Stakeholder meeting (March 2018)

Group Discussion

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