SAFE, CLEAN WATER PROGRAM

FEASIBILITY STUDY REPORT

Regional Program Projects Module

PROJECT NAME	Via Princessa Park and Regional BMP Project
PROJECT LEAD(S)	Heather Merenda, City of Santa Clarita Environmental Services Division
SCW WATERSHED AREA	Santa Clara River
PRELIMINARY SCORE	97
TOTAL SCW FUNDING REQUESTED	$ 19,359,952.00
YEAR 1 FUNDING REQUESTED	$ 11,055,620.00

Submitted On: Thursday, July 28, 2022

Created By: Heather Merenda, Stormwater Compliance Administrator (Via Princessa Park Santa Clarita)

OVERVIEW

The objective of the Regional Infrastructure Program under the Safe, Clean Water (SCW) Program is to plan, build, and maintain multi-benefit watershed-based projects that improve water quality and increase water supply and/or enhance communities. A Feasibility Study is required before a project can be submitted for consideration and scoring for funding through the Los Angeles Region Safe, Clean Water (SCW) Program's Regional Infrastructure Program. Each Feasibility Study should provide enough information about a potential project to allow the Watershed Area Steering Committee members to make an informed decision for as to which projects should move forward for consideration for funding. The Minimum Feasibility Study Requirements for the Scoring and Consideration of Regional Infrastructure Program Projects is available at: https://portal.safecleanwaterla.org/projects-module/.

This document is based upon an output from the web-based tool called the 'SCW Regional Projects Module' (https://portal.safecleanwaterla.org/projects-module/). This output summarizes the information and data provided to Regional Projects Module, and also provides an initial estimate of project scoring per the SCW Infrastructure Program Project Scoring Criteria.

IMPORTANT: *ALL SCORING ESTIMATES GENERATED BY THE PROJECTS MODULE ARE PRELIMINARY AND SUBJECT TO REVIEW AND REVISION BY THE SCORING COMMITTEE.*

ORGANIZATIONAL OVERVIEW:

1 GENERAL INFORMATION

This section provides general information on the project including location and project description.

1.1 Informational Session

Which information session did you attend?

4th Session (June 29th)

If you were not able to attend, did you view the recording?

No

Attendee(s) Name:

Dan Duncan, Leslie Frazier

Attendee(s) Email:

DDuncan@Santa-Clarita.com

1.2 Overview

The following table provides an overview of the project and the Project Developer(s):

Project Name:	Via Princessa Park and Regional BMP Project
Project Description:	The proposed project, located in the City of Santa Clarita, will include an underground infiltration BMP system and a new park.
SCW Watershed Area:	Santa Clara River
Call for Projects year:	FY23-24
Total SCW Funding Requested:	$ 19,359,952.00
Phase(s) this application is requesting SCW funding for:	Construction, O & M
Project Weather Type:	Wet
Project Lead(s):	Heather Merenda, City of Santa Clarita Environmental Services Division
Additional Project Collaborators:	Leslie Frazier, City of Santa Clarita Associate Engineer, Public Works-Capital Improvement Projects
Additional Project Collaborators:	Dan Duncan, City of Santa Clarita Environmental Administrator, Public Works
Additional Project Collaborators:	Duong Do, Pacific Advanced Civil Engineering, Vice President, Environmental Water Division
Anticipated IPPD:	City of Santa Clarita
Is this a non-municipal project?	No
Primary Contact (if differs from submitter):	N/A
Primary Contact Email (if differs from submitter):	hmerenda@santa-clarita.com
Secondary Contact (if differs from submitter):	Dan Duncan, Environmental Administrator
Secondary Contact Email (if differs from submitter):	dduncan@santa-clarita.com

1.3 Project Location

The following table summarizes the project location:

Latitude:	34.41015
Longitude:	-118.47191
Street Address:	19201 Via Princessa
City:	Santa Clarita
State:	N/A
Zip Code:	91321
Municipality:	Santa Clarita

Please see the following attachment(s) for a project location map.

Attachments for this Section	
Attachment Name	Description
Parcel Ownership Map.pdf	

Will the project provide benefit to a Disadvantaged Community (DAC)?

Yes

If Yes, Describe how the project will provide benefits to a DAC.

The project will benefit the DAC through water quality improvement, creation of a new park, enhanced/restored riverine habitat, improved access to the Santa Clara River and Honby Channel, creation of new recreational opportunities, and reduced heat island effect/increased shade, trees, and vegetation. The project will also provide groundwater supply benefits to the broader community, which will also benefit the DAC.

The project site is located within a 2018 tract identified by the State of California as a Disadvantaged Community with a median household income between $42,737 & $56,982. The State of California's online DAC mapping tool also shows that the project site is located within a 2018 block group with a median household income less than $42,737. The California median household income is $71,228. This means that the the community located around the project site earns up to 60% less than the rest of the state, which qualifies as a severely disadvantaged community. (See attachment page 2 of Section 8.7 for backup)

According to CalEnviroScreen 4.0, the census tract containing the project site (60373920036) has an overall percentile score of 35. Census tracts immediately adjacent to the project site have percentile scores ranging from 51 to 65. CalEnviroScreen identifies California communities that are most affected by pollution, and where people are often especially vulnerable to pollution's effects. An area with a high score is one that experiences a much higher pollution burden than areas with low scores. (See attachment page 4 of Section 8.7 for backup)

These statistics show that the area surrounding the park is home to disadvantaged community members and that the project is ideally located to meet their needs. Further details of the benefits provided to the DAC are discussed in the following sections.

If Yes, Describe how the project will provide water quality benefits to a DAC.

The Via Princessa project will reduce trash and other pollutants entering the Santa Clara River from the Honby Channel watershed. The Honby Channel watershed is 998 acres in size and more than 50% developed (See attachment page 2 of Section 2.2 for backup). Many pollutants associated with urban runoff currently travel to the Santa Clara River through Honby Channel, negatively impacting the DAC as they walk through and interact with the river.

The project proposes to reduce those pollutants by diverting and infiltrating up to the 85th percentile storm volume. All trash and other pollutants associated with this volume will be removed from the flow path. Additionally, bio-swales will be incorporated throughout the park to treat and convey on-site runoff, before it drains to the Honby Channel. A swath of native plants that are proposed to be planted in the Honby Channel, downstream of the culvert, will also provide natural treatment processes for flows bypassing the diversion to the BMP. These project features will reduce the pollutant loads reaching the Santa Clara River and downstream water bodies, providing a safer and more enjoyable experience to the DAC living near the project site. More details of the water quality benefits provided to the community are discussed in sections 3.1 and 3.2.

If Yes, Describe how the project will provide water supply benefits to a DAC.

The proposed project will provide water supply benefits to the community at large, which also benefits the nearby DAC. The City of Santa Clarita is unique in the fact that it relies on groundwater for approximately half of the community's domestic water supply. The Santa Clarita Valley Groundwater Basin is an important resource to the community and must be managed properly in order to provide for future generations and in continued drought conditions. The project site is specifically situated above the Santa Clarita Valley East Subbasin. Without the proposed facility, stormwater runoff from Honby Channel enters the Santa Clara River and infiltrates into the groundwater basin further downstream. Modeling has shown that with the proposed facility, the diverted stormwater will infiltrate into the ground further upstream, increasing the groundwater levels at at least 3 nearby production wells (See attachment page 42 of Section 2.4 for backup). This is important since production wells in the East Subbasin have occasionally been taken offline due to low groundwater levels, which can make operation of those wells difficult, if not impossible. The reduction in active wells results in less available groundwater supply, which must be made up with imported water or water from other sources, which is more expensive. The project will protect valuable groundwater infrastructure by infiltrating more water on the east side of the basin, thereby increasing well production. This creates a more resilient water supply for the community, and reduces the costs associated with acquiring water from other sources, which will benefit the DAC.

Additionally, the East Subbasin is known to be a shallow aquifer and the Santa Clarita Valley Groundwater Sustainability Agency has established a goal of infiltrating more water into this area of the aquifer, because groundwater is most easily extracted in this shallow zone. The Saugus Formation further downstream results in the loss of some groundwater to deeper/older layers of the aquifer. This loss results in less local water supply from groundwater sources, requiring more water to be obtained from other sources, which are more costly. The project will support the goals of the water agency and subsequently have the potential to benefit the DAC through lower utility costs by promoting infiltration in the East Subbasin. Further details of how the project provides water supply benefits are discussed in sections 4.1 and 4.2.

If Yes, Describe how the project will provide community investment benefits to a DAC.

The Via Princessa project will provide 15 acres of new park in a recognized park-poor community, which also has limited access to the Santa Clara River and Honby Channel. The LA County 2016 Park Needs Assessment categorized the communities surrounding Via Princessa as having a park need rating of "Moderate", "High," and "Very High", with a majority of areas surrounding the park being categorized as "High" (see attachment page 9 of Section 8.7). Additionally, numerous community surveys and needs assessments have been performed by the City of Santa Clarita, which demonstrate that the park site is situated in a service gap area (see City of Santa Clarita Parks and Recreation Open Space Master Plan, page 3-16, attached to section 8.7). The project will specifically benefit the nearby DAC, as it will be within a 1/2 mile radius of 4,136 community members, 351 of which are living in poverty (according to CA State Parks Community Fact Finder, see attachment page 3 of section 8.7). The park will also be within a 1/2 mile radius of 71 households who do not have access to a car (CA State Parks Community Fact Finder), and will not need to rely on a vehicle to access and enjoy the park. Further details of the benefit of increased park space to the community is discussed in sections 5.1 and 5.2.

The project will also benefit the DAC through enhancement of riverine habitat. Currently, Honby Channel conveys a small but continuous dry weather flow, which supports non-native and invasive vegetation just downstream of the culvert. Additionally, sediment deposition has occurred over the years, reducing the slope of the channel and negatively impacting its ability to convey the 100-yr storm peak flow rate. The project proposes to clear out the accumulated sediment and vegetation downstream of the culvert, which will improve the hydraulic capacity of the channel and remove unwanted species of plants. The channel will be re-graded and new native, drought resilient plants will be established in the channel, covering approximately 1.6 acres (see plant palette attachment pages 3-5 of section 5.2). The plants will provide habitat to animals and insects that are unique to Santa Clarita and the Santa Clara River. The proposed vegetation will help create a more balanced ecosystem near the park and will be a centerpiece for visitors of the park to view and learn about. The DAC, who will be closest in proximity to the park, will benefit from this interaction and will also experience the water quality benefits provided by the vegetation. The vegetation in Honby Channel will provide natural treatment of flows traveling to the Santa Clara River. Members of the DAC currently walk through and interact with the River and will benefit from a reduction of pollutants in the River. Further discussion of the benefit of enhanced habitat to the community is discussed in sections 5.1, 5.2, and 6

The Via Princessa project will also improve access to both the Santa Clara River and Honby Channel for the DAC. Currently, the SCRRA railroad, located near the the south bank of the Santa Clara River (SCR), creates a barrier to accessing the river from the communities to the south. Trails along the north bank of the SCR provide some access to the River, but not to all of the community. Additionally, Honby Channel is not currently easily accessible to communities living on either the north or south banks. The creation of a park at Via Princessa will provide the DAC access to the River and Channel through a pedestrian crossing beneath the railroad. Many members of the DAC will live within walking distance (1/2 mile radius) to the park and will be able to access these valuable community resources with much more ease. Further discussion of the benefit of improved access to the Santa Clara River and Honby Channel to the community is discussed in sections 5.1 and 5.2.

The project will also create new recreational opportunities for the nearby DAC. The City of Santa Clarita Parks and Recreation 5-yr plan performed numerous community surveys, which demonstrated that the surrounding community has a need and desire for more parks and multi-use fields. The project will provide new recreational opportunities through the creation of 4 multi-use fields, in addition to picnic areas, play areas, trails, educational centerpieces, and a landscaping plan focused on drought resilience (see park concept plan on attachment page 2 of section 2.1). Out of the 4,136 community members living within a 1/2 mile radius of the park, 351 are living in poverty, and 843 are younger than 18yrs old (according to CA State Parks Community Fact Finder). The recreational opportunities provided by the park will especially be a benefit to the DAC and the youth, who do not currently have many options for sports, recreation, and outdoor activities. Further details of the benefits of added recreational opportunities are discussed in sections 5.1 and 5.2.

Via Princessa Park will also reduce heat island effect through an increase in shade, planting of trees, and other vegetation. Currently, the site is undeveloped and contains some scattered vegetation, some of which is non-native. The project will clear out the existing vegetation on the site and replace it with turf and native, drought-resilient plant species. Approximately 4.6 acres of new vegetation will be planted on the site, not including the proposed enhancement in Honby Channel. Additionally, 309 trees and 19 shade structures will be installed, providing additional shade to park visitors, lowering temperatures, improving soil quality, and providing habitat. The reduced heat island effect will especially benefit the nearby DAC members, many of which live within a 1/2 mile radius of the park. Additional details on the benefits of reduced heat island effect and increase in shade, planting of trees, etc. are discussed in sections 5.1, 5.2, and 6.

If Yes, Describe how the project engaged the benefitting DAC(s) to date.

The City has solicited input from the community in the past, regarding the needs and desires for potential park sites around the City. For example, the Parks and Recreation 5-year plan included two separate community surveys along with a series of focus group meetings consisting of community stakeholders, Parks, Recreation, and Community Services Commissioners and City staff. The results of this survey showed that residents want an increase in access and opportunities for passive and active recreational programming in designated Open Space areas.

Additionally, the Parks and Recreation Open Space Master Plan Update identified potential sites within the City that could be converted into parks and other recreational facilities. This study identified the Via Princessa site as an acquisition target (the site was purchased from the County by the City in 2016; page 2-16 in attachments to section 8.7). This study also solicited community input through three (3) workshops, stakeholder interviews, community focus groups, sports organization survey, community-wide telephone survey, and a recreation facility demand/needs analysis. The feedback received from the community included a desire to expand or renovate existing parks, build more multi-use fields, and acquire vacant or open space land. The neighborhood park service area analysis in this study also found that the area that the Via Princessa park site is situated in is a service gap area, which can be addressed by adding a new facility.

Project-specific engagement was performed for the nearby communities. This included ongoing conversations with the site manager at Cordova Estates, which is the mobile home park that borders the project site on the East. The Cordova Estates community is part of a DAC tract and will be closest in proximity to the proposed park and supports the project. The City has received a letter of support from the Cordova Estates community. The residents of Cordova Estates were directly invited to a July 14 2022 open house event and provided the flyer and request to complete the survey if they couldn't attend the open house. The details of the open house are expanded on in "5.3 Local Support" section of the application. Consistent with previous construction projects, the City will work to have additional, direct communication with the Cordova Estates residents on the park elements. Staff anticipates at least one meeting at their community to discuss concerns and opportunities. There will also be a communication process for during construction to address concerns and issues.

Is the project located in a DAC Census Block Group as defined by SCW?

Yes

If No, Please describe if there is a formal or informal community boundary more appropriate than a Census Block Group boundary to consider for the benefit area of a particular project where the median householder income statistic or current Cal Environ Screen tool considers that community 'disadvantaged'?

N/A

Does this project comply with the anti-displacement policies of the Feasibility Study Requirements?

Yes

If Yes, Describe how anti-displacement policies were considered.

The City of Santa Clarita currently has one anti-displacement policy in effect: Mobile Home Rent Control. This policy prevents the excessive and unreasonable increase in manufactured home park space rent. The proposed project site is situated within a 3 mile radius of six mobile home parks. While the park may increase the desirability of living within those communities, the mobile home rent control policy ensures that increases in rent will not be excessive or unreasonable and ensures that mobile home owners have a right to appeal any rent increases they deem to be unreasonable. The project aims to enhance benefits for nearby mobile home owners and DAC members by engaging the existing community through language access and cultural inclusion; not by seeking out future residents. The project could also be used to employ small, local businesses and workers for refreshment stands on the park, as well as engage local schools and youth organizations to utilize the park for events. The Los Angeles County Local Hire policy will also be applied to the construction of the park.

Have engaged and received support to implement project at the project site?

Yes

Please see the following attachment(s) for a letter of support.

1.4 Project Description

Attachments for this Section	
Attachment Name	Description
Compact Project Summary - Via Princessa.pdf	

Regional water management plan that includes the proposed project:

E/WMP

Provide details on the selected regional water management plan that includes the proposed project

The project is included the Upper Santa Clara River Enhanced Watershed Management Program (EWMP). It should be noted that, previously, the site was referred to as 'Site X' and is listed as such in the EWMP. Since then, the site name has been identified as 'Via Princessa'. A reduced version of the EWMP has been included in the attachments for section 1.4 (EWMP begins on page 32. Project is listed on p.5-7).

The project has been submitted for consideration in the Upper Santa Clara River Integrated Regional Watershed Management Plan (IRWMP), pending review. The Upper Santa Clara River Watershed has its own IRWM and is not part of the Greater Los Angeles IRWM. Final decisions for the inclusion of a project in the IRWMP are scheduled to take place August 2022. A reduced version of the IRWMP has been included in the attachments for section 1.4 (IRWMP begins on first page of the attachments). Water quality is discussed in section 3.2 of the IRWMP (beginning p. 3-14).

Detailed description and historical background of the project:

The Via Princessa property is made up of 5 parcels (2836-002-922 / 2836-002-907 / 2864-003-923 / 2864-003-922 / 2864-003-920) that are all owned by the City, situated adjacent to the Santa Clara River just north of the SCRRA railroad at the Via Princessa Metrolink Station. The boundary of the 5 combined sites makes up the project site, consisting of approximately 26 acres (see parcel map included on first page of Section 1.3 attachments). Historically, the site was utilized for row crop agriculture between 1900 and 1969. The site has not been utilized for agricultural use since 1969 and has remained vacant since then. In 2016, the property was purchased from the County of Los Angeles to the City of Santa Clarita. Portions of the site are within the FEMA 100-yr (Zone AE) and 500-yr floodplains (see FEMA FIRM panel included on page 56 of Section 8.7 attachments).

The proposed project would occupy approximately 25.7 acres, consisting of above- and below-ground improvements. The above-ground improvements would include a new park / recreational facility and would be designed to be outside of / above the 100-yr floodplain by elevating the site. The below-ground improvements include an infiltration BMP, which will divert stormwater runoff from the nearby Honby Channel outlet. The infiltration BMP itself would most likely be made up of perforated corrugated metal pipe surrounded by a bed of porous materials. See page 1 of the attachments for section 2.1 to see a conceptual project layout with key components.

The existing Honby Channel outlet has a triple box culvert configuration, with each cell measuring 8 ft. high by 8 ft. wide (title sheet for as-built plan set of the culvert is included on page 18 of the attachments for section 8.1). Downstream of the Honby Channel outlet, water flows through a naturally incised flow path before converging with the Santa Clara River. This area will be altered to divert flow to the underground BMP and to restore the hydraulic capacity of the channel. The restoration efforts will remove sediment that has built up over the years and abate invasive plant species. New native vegetation will be replanted in the channel which will support small wildlife, provide shade, create an aesthetically pleasing centerpiece of the park, and serve as an educational piece to the public, with illustrative signage describing the Channel/diversion's purpose and function (see landscape plan on page 5 of the attachments for section 2.1). A portion of flows will continue flowing downstream past the diversion, in order to support the new vegetation.

Hydrodynamic separators will provide pretreatment to the captured water before it enters the infiltration BMP. This is necessary for removing trash, floatables, oils, heavy metals, and sediment before it enters the infiltration chambers. Sediment and other particles that are often transported by stormwater can cause the infiltration zones to become clogged, requiring frequent maintenance and repair without the aid of pretreatment devices.

The existing parking lot at the Via Princessa Metrolink station, on the south side of the railroad tracks, will be utilized by those accessing the park. An access tunnel will be constructed beneath the railroad, in order to provide safe passage to park visitors. The parking lot is proposed to include additional spaces and will incorporate additional vegetation & trees to provide shade and create a visually aesthetic amenity.

The objectives of the project are to reduce pollutants reaching the Santa Clara River, improve the water supply in the Santa Clara River Valley East Groundwater Basin, sustain nearby production wells, and to meet the park / recreational needs of the surrounding community. The Project will achieve the pollutant reduction objective by diverting the 85th percentile storm runoff away from the Santa Clara River and treating it through the pretreatment and infiltration processes. The project will achieve the water supply objective by infiltrating the 85th percentile runoff volume from Honby Channel. The BMP and park will provide recreational and health benefits to the surrounding community, as well as improved quality of life, educational opportunities, and improved water resource management.

Please see attached proof that applicant is part of a watershed management plan:

Attachments for this Section	
Attachment Name	Description
IRWMP - Excerpt.pdf	IRWMP has been shortened to meet file size limit. Missing pages/appendices can be provided upon request. Figure 1.1-1 shows the groundwater basin map. The water quality discussion begins on page 3-14.
Pending IRWMP Project Addition.pdf	Email correspondence regarding addition of Via Princessa Project to the IRWMP project database. Via Princessa project is in progress, undergoing evaluation for addition to the IRWMP and funding.

EWMP - Excerpt.pdf	EWMP has been shortened to meet file size limit. Missing pages/appendices can be provided upon request. Page ES-4 shows SCR TMDL's and watershed control measures. Page ES-6 shows structural BMP capacity milestones. Page 5-7 shows the Via Princessa Tier A project listing.

2 DESIGN ELEMENTS

This section provides an overview of the project design details.

2.1 Configuration

The following table is a summary of the project configuration:

Project Configuration Summary	
BMP Type:	Infiltration Facility
Infiltration Footprint Area:	2.1 ac
Ponding Depth:	8 ft
Media Layer Depth:	0.5 ft
Media Layer Porosity:	0.4 ft
Underdrain Layer Depth:	0 ft
Underdrain Layer Porosity:	0 ft

Calculated Storage Volume	
Module-generated Storage Volume:	17.2200 ac-ft

Please upload a description and detailed schematic of the project layout including its anticipated footprint and key components such as, but not limited to: inlets, outlets, diversion point, recreational components, nature-based components, pumps, treatment facilities, underdrains, conveyance, above ground improvements, and other project components.

Attachments for this Section	
Attachment Name	Description
1 - Detailed Schematic - Conceptual Plan.pdf	Detailed schematic: conceptual plan of the park with an overview of key project components.
2 - Detailed Schematic - Recreation Components.pdf	Detailed schematic: Key recreational project components.
3 - Detailed Schematic - Community Engagement Components (1).pdf	Detailed schematic: Key community engagement project components.
4 - Detailed Schematic - Nature-based (LID) Components.pdf	Detailed schematic: Key nature-based (LID) project components.
5 - Detailed Schematic - Nature-based (Landscaping) Components.pdf	Detailed schematic: Key nature-based (landscaping) project components.
6 - Detailed Schematic - Infiltration BMP Components.pdf	Detailed schematic: Key infiltration BMP project components (graphical concept).
7 - Detailed Schematic - Infiltration BMP Components - Plan & Profile.pdf	Detailed schematic: Key infiltration BMP project components (engineering concept).

2.2 Capture Area

For Projects in watersheds with existing downstream stormwater capture facilities (or other proposed downstream projects), please complete a good faith effort to establish and describe the relationship to downstream projects and implementation schedule.

The proposed Via Princessa project does not impact or interact with downstream projects.

The size and land uses of the capture area upstream of a project plays an important role in its water quality and water supply benefits. The capture area information here is used by the Module for scoring:

Capture Area Summary	
Capture Area:	997.8 ac
Impervious Area:	364 ac
Pervious Area:	633.8 ac

The following table is a summary of the land use breakdown for the area that drains to the project:

Breakdown of Impervious Acreage in Capture Area		
Land Use Type	Percent Impervious	Acres
Commercial	11.02 %	40.1128
Industrial	1.48 %	5.3872
Single Family Residential	0.22 %	0.8008000000000001
Multi Family Residential	83.99 %	305.7236
Secondary Roads and Alleys	0.21 %	0.7644
Institutional	3.08 %	11.2112

The following table is a breakdown of the municipal jurisdictional areas within the project capture area:

Breakdown of the Municipal Jurisdictional Areas within the Project Capture Area		
Municipal	Tributary Percent	Acres
None provided	N/A	N/A

Attachments for this Section	
Attachment Name	Description
Via Princessa Watersheds.pdf	Sub-watersheds and flow paths draining to the Via Princessa site.
Via Princessa Land Uses within Watershed.pdf	Land uses within the watershed draining to the Via Princessa site.

Has a shapefile of the project capture area has been uploaded to the project?
Yes

2.3 Diversion

Diversion Structures generally apply to 'off-line' regional projects where stormwater is diverted from a major water conveyance (e.g., gravity main) and directed to the project at a predetermined maximum rate. Smaller distributed projects, like bioretention, do not normally utilize these devices.

Does the project have a diversion structure?

Yes

The following table provides details on the diversion type and maximum diversion rate:

Diversion Details	
Type of Diversion	Typical Max Diversion Rate (cfs)
Gravity Flow	76.9 cfs

Description of Diversion:

Flow that currently exits the Honby Channel culvert beneath Via Princessa Rd. merges with the Santa Clara River or, during dry weather flow, infiltrates into the ground not far downstream of the culvert. Under proposed conditions, the culvert will be extended a short distance further into the channel, in order to provide room for a maintenance access road on top of the culvert, leading to the BMP on the west side of Honby Channel. A short segment of the channel downstream of the extended culvert will be armored in order to prevent erosion and to incorporate the diversion structure. A weir with a low flow outlet will be installed immediately downstream of the diversion structure. The low flow outlet will allow some dry weather flows to continue being conveyed downstream, where they will infiltrate into the ground and support the proposed native vegetation. During larger flow events, flow will back up behind the weir until it reaches an elevation where it can spill over into the diversion structure leading to the underground BMP. Flows diverted to the BMP during this scenario will undergo pretreatment in a series of hydrodynamic separators before continuing to the infiltration gallery, where they will infiltrate into the ground. The diversion structure, diversion line, and hydrodynamic separators will all be sized to accommodate the peak flow rate associated with the 85th percentile storm event. Flow rates in excess of this amount will bypass the diversion by overtopping the weir in Honby Channel, and continuing to flow downstream towards the Santa Clara River, as occurs in existing conditions.

2.4 Site Conditions & Constraints

Describe existing and/or potential constraints or limitations due to existing site conditions (i.e landfill site, coordination with regulatory agencies, etc).

Many studies have been performed in order to evaluate site conditions, including a geotechnical investigation, a topographic and utility survey, as-built research, a hydrology analysis, a Phase I study, and a groundwater modeling study.

The geotechnical investigation was performed by R.T. Frankian & Associates in January 2022, primarily in order to identify infiltration rates of the site soils. A subsequent report summarizing the findings of that investigation was completed March 30, 2022. Three borings were performed in the vicinity of the proposed infiltration facility, to depths varying from 20 to 50 ft. below existing ground surface (IB-1, IB-2, and IB-4). Infiltration test wells were installed in two of the three borings near the proposed location of the BMP (IB-1 and IB-2). The infiltration tests resulted in a design infiltration rate of 4.92 in/hr. beneath the infiltration BMP, which is well above the minimum required infiltration rate for LA County of 0.3 in/hr.; therefore, the site is feasible for infiltration (backup for infiltration rate is shown on page 5 of the attachments to section 3.3). Additionally, groundwater was not encountered during the surbsurface investigations, which means dewatering will not need to take place during construction. Taking historic groundwater elevation data into account, the depth to groundwater ranges from 10 ft. to

97 ft. below ground surface, with an average depth to groundwater of about 44 ft. from 1983 to 2012. This indicates that stormwater flows should be designed to bypass the facility when groundwater is detected within 10ft. of the invert of the infiltration facility, in order to follow County guidance. The Seismic Hazard Zone Map for the Mint Canyon Quadrangle (March 25, 1999) indicates that the project site is classified as being potentially susceptible to liquefaction; however, there are not any proposed habitable structures as part of the development, so a liquefaction evaluation was not performed and will not impact the design. The geotechnical report is included in the attachments to section 2.4.

A survey was performed at the site on Nov. 22, 2021 by Vertex Survey, Inc. in order to identify existing elevations at the site, right-of-way limits, and existing utilities which might present a conflict to the design. Vertex captured all above-ground features, including buildings, parking lots, striping, sidewalks, topography, trees, etc. in their analysis. Additionally, on-site utilities were located in City records and included on the site plan base map. These include water and sewer lines on the eastern edge of the site and overhead electrical lines, which parallel the railroad. The existing utilities are not anticipated to conflict with the design of the infiltration BMP or the park site. The utilities identified by the survey/as-builts research are shown on page 49 of the attachments to section 2.4 and the right-of-way limits are shown on the attachment to section 1.3.

Additionally, as-built information was obtained for the Honby Channel triple 8'x8' reinforced concrete box culvert. The elevations and slopes shown thereon were used to design the culvert extension and tie-in points for the proposed condition Honby Channel. Elevations were converted from NGVD29 to NAVD88. Ownership/maintenance of the Honby Channel culvert is the responsibility of the Southern California Railroad Association (SCRRA); therefore, conceptual approval from LA County for tying into the culvert will not need to be pursued. The title page of the as-built plan for the Honby Channel culvert is included on page 20 of the attachments to section 8.1.

A hydrology analysis was performed by PACE in February of 2022, in order to determine the design capture volume of the BMP and the design peak flow rate of the diversion structure and pre-treatment devices. First, a detailed watershed analysis was performed for all areas draining to the diversion point within Honby Channel. The results of this analysis showed a watershed area of 998 ac, of which approximately 36% is impervious, mostly containing soils classified as hydrologic group B (all hydrologic input data is shown on pages 31-36 of the attachments to section 2.4). It should be noted that the watershed area delineated in the PACE analysis is slightly different from the watershed value shown in the EWMP (982 ac). This difference would not cause a significant change in stormwater runoff volume results or peak flow rates and can be considered negligible. This discrepancy is likely caused by difference in topographic source and the level of refinement of data used. Using the PACE hydrologic data, as well as the 85th percentile precipitation depth of 0.9 inches (published in LA County Hydrology Manual) a runoff computation analysis was performed using HEC-HMS, a hydrologic modeling software. The overall watershed was split into 50 subareas and 45 subreaches. The results from this model show an 85th percentile runoff volume of 30.1 ac-ft and a peak flow rate of 76.9 cfs (hydrograph shown on page 37 of the attachments to section 2.4). This demonstrates that the stormwater proposed to be diverted and infiltrated is a significant amount, making the project worthwhile. The volume and flow rate obtained from the hydrology analysis were used to size the infiltration facility, diversion structure, diversion pipe, and hydrodynamic separators.

The Phase I study, performed by JHA Environmental in December 2018, revealed no evidence of RECs, as defined by the ASTM Designation E1527-13 at the site. The Phase I study is included on pages 1-19 of the attachments to section 8.1.

A model of the groundwater system and the effects the project would have on it was prepared by GSI Water Solutions in May 2022. The potential benefits from the infiltration BMP were evaluated using a three-dimensional numerical groundwater flow model that was recently developed for the local groundwater basin, during the preparation of a Groundwater Sustainability Plan on behalf of the Santa Clarita Valley Groundwater Sustainability Agency. The model evaluated storm events that occurred between January 2006 and January 2008. Various storms occurred during that time period, some of which were at or below the 85th percentile storm threshold and some of which were greater. The modeling showed that the infiltration facility has minor but beneficial effects on the groundwater elevations at nearby production wells. On average, the proposed infiltration facility would increase the groundwater levels by about half a foot at the nearby wells. Although not substantial enough to alter the operation of those wells, it represents a benefit since many wells in the area overlying the Eastern Santa Clarita Valley Groundwater Basin have been taken offline in drought years due to low water levels. A single 100-yr storm event was also evaluated, in order to quantify the maximum mounding of groundwater beneath the facility. The simulation of the 100-yr storm showed that the groundwater elevations of the underlying Alluvial Aquifer would come within 5 feet of the proposed BMP invert during the infiltration event. However, it was noted that this mound would dissipate quickly due to the high permeability of the sediments comprising the Alluvial Aquifer. It is recommended that stormwater flows bypass the facility when groundwater is detected within 10ft. of the invert of the infiltration facility, in order to follow County guidance. A short summary of the model and results, prepared by GSI has been included in pages 38-48 of the attachments to section 2.4.

Please provide a summary for each of the uploaded attachments below that describes the methods, outcomes and how the information will be incorporated into the project design.

N/A

Does the project involve LACFCD infrastructure, facilities, or right-of-way?

No

Please see the following attachments for additional details on geotechnical, hydrology, right-of-way and/or LACFCD, and utility conditions.

Attachments for this Section	
Attachment Name	Description
Geotechnical Study (RT Frankian).pdf	

Attachments for this Section	
Attachment Name	Description
Hydrology Analysis.pdf	
Groundwater Modeling (GSI) Study.pdf	

Attachments for this Section	
Attachment Name	Description
Existing Utility Locations.pdf	

2.5 Monitoring

This section provides an overview of monitoring data related to the project.

Has any monitoring data been compiled related to the project?

Yes

Please provide an overview of the monitoring performed to date:

Some water quality monitoring has been performed in the Santa Clara River, near the project. The monitoring site is located at a land use outfall further upstream and was used to inform some of the water quality goals listed in the EWMP/IRWMP. The monitoring is performed by the Upper Santa Clara River Coordinated Integrated Monitoring Program (SCR CIMP).

A project-specific monitoring plan has been developed and is included in the attachments to section 2.5.

Please upload a monitoring plan to measure the effectiveness of the proposed project once completed, including metrics specific to the identified benefits. Also attach supplemental information on monitoring conducted to date, if applicable.

Attachments for this Section	
Attachment Name	Description
2022-05-13_Monitoring Plan.pdf	

2.6 O & M

Provide an overview of the plan for how operations and maintenance of the Project will be carried out. Identify the responsible party and describe any technical expertise required for O & M.

The responsible party for O&M will be the City of Santa Clarita. Maintenance personnel shall be trained for the tasks involved in maintaining the infiltration gallery and hydrodynamic separator. All maintenance personnel assigned to work inside of the infiltration gallery or hydrodynamic separator shall be OSHA certified in confined space entry.

For the diversion structure, typical tasks include inspection for sediment accumulation and obstructions at least twice per year and after rain events during the first two years. Observation activities include measurement of sediment, and maintenance activities include removing sediment with a vacuum truck after 3-inches of depth is observed, as well as removal of any obstructions/debris that is present.

For the hydrodynamic separator, specific maintenance procedures will be provided by the manufacturers. Typical tasks include inspection at least twice per year and after each rain event during the first two years, measurement of sediment accumulation, cleaning sediment and accumulated debris with a vacuum truck, and replacement of damaged components. When sediment occupies more than 25% of the depth of the solids storage sump, the unit will be cleaned by vacuum truck. System components are expected to last at least 50 years without replacement. Existing City stormwater crews have experience with maintaining many existing vortex systems and with a similar infiltration gallery; however, specific training for the Via Princessa Project will be provided to them.

For the infiltration gallery, typical tasks include inspection for sediment accumulation quarterly and one inspection shall occur 30 days prior of October 1st. Inspection shall also occur after all rain events during the first two years. Inspections will include measurement of accumulated sediment, and removal of sediment with a vacuum truck after 3 inches of depth is observed. Vector control inspections will also take place quarterly to observe the presence/breeding of any pests and take corrective action as necessary.

The restored Honby Channel area will need to be inspected quarterly for overgrown or dying vegetation, sediment accumulation, damage to overflow devices, and trash or other visible contaminants/pollution. Maintenance activities will include removing any dead vegetation, trimming overgrown vegetation, removing excessive sediment buildup, repairing damaged overflow devices, and removing trash or other visible contaminants/pollution.

Attachments for this Section	
Attachment Name	Description
VIa Princessa O&M Agreement-Signed.pdf	

3 WATER QUALITY BENEFITS

This section provides an overview of project elements related to water quality benefits, including calculations used for Section A (Water Quality Benefits) of SCW Project Scoring Criteria.

3.1 Water Quality Needs

Please describe any known or perceived Water Quality needs of the watershed area:

The project is located next to Reach 7 of the Santa Clara River. Stormwater runoff is regulated in the Santa Clara River by The Los Angeles County MS4 Permit (Order No. R4-2021-0105 / NPDES No. CAS004004) (MS4 permit). Several pollutants have a Total Maximum Daily Load (TMDL), including E. Coli, nutrients, and chloride, which have been incorporated into that MS4 permit. The City of Santa Clarita is responsible for complying with the TMDL's listed in the MS4 permit. In order to establish a plan for meeting these requirements, the Upper Santa Clara River Watershed Management Program Group, which includes the City of Santa Clarita, LA County, and LA County Flood Control District, collaboratively developed the Upper Santa Clara River Watershed Management Group's Enhanced Watershed Management Program (EWMP). The EWMP was developed to meet the state issued permit requirements to protect the beneficial uses of the Upper SCR watershed receiving waters.

The MS4 Permit, lists the TMDLs for Reach 7 of the Santa Clara River in Attachment M. Relevant pages from Attachment M have been included in the attachments to section 8.7 (attachment pages 80-83). Reach 7 is subject to one TMDL, which is bacteria, specifically constituent E. coli (see MS4 permit page M-1 and M-2). The EWMP, which aims to meet the requirements of the MS4 permit, lists Bacteria (constituent of E. Coli) and chloride as Priority 1 TMDLs, and also lists Trash, Copper, Mercury, and Cyanide as Priority 2 pollutants of concern (see EWMP page ES-4). These TMDLs indicate a need to improve the water quality of both wet- and dry-weather flows before they reach the Santa Clara River. The EWMP has established two overarching categories of Best Management Practices (BMPs) that are identified as watershed control measures (WCMs): Structural BMPs and Institutional BMPs (see EWMP page ES-4). The City has set a goal of instituting 285 ac-ft of structural BMPs by the year 2029 (see EWMP page ES-6).

Please describe how your project will address this need and/or achieve similar desired outcomes within the watershed area:

According to the definition listed in the EWMP, the Via Princessa BMP is considered a Structural BMP and would contribute 30 ac-ft of storage to the 2029 milestone of 285 ac-ft. The EWMP also lists the Via Princessa project as a Tier A (highest priority) regional control measure (see page 5-7 of the EWMP).

The proposed infiltration BMP would capture all of the runoff associated with 85% of storms in a given year by diverting that flow away from the Honby Channel outlet into the BMP. From the infiltration gallery, the captured water would infiltrate into the ground, undergoing further, natural filtration processes. The captured water will be removed from the existing flow path to the Santa Clara River, which would include nearly all of the bacteria, chloride, trash, copper, mercury, cyanide, and other pollutants associated with the 85th percentile runoff from Honby Channel. Long term pollution reduction calculations are shown in section 3.5.

Additionally, bio-swales will be incorporated within the park to convey on-site runoff to Honby Channel. The bio-swales provide a natural treatment process for the water they convey. Similarly, the new native vegetation that will be planted within Honby Channel will provide further natural treatment to flows that bypass the diversion structure. Bioswales are a type of LID and are also categorized as a Structural BMP in the EWMP. Sizing of the bioswales will occur during a later design phase and will be designed to convey on-site runoff. The volume of the bioswales will help contribute to the 'LID (public)' portion of the City's 2029 structural BMP capacity milestones.

Please describe the process to determine the proposed project scope. If you are utilizing Nature-Based Solutions (natural processes or nature-mimicking strategies) to address the specific need, please include a discussion of how Nature-Based Solutions was considered and justification for the proposal as is:

The location of the Via Princessa project was selected based on the priorities listed in the EWMP. An underground infiltration BMP was selected due to its ability to create multi-benefit uses of one space and the fact that it is a nature-mimicking strategy that captures and infiltrates runoff into native soils. The EWMP identified the project site as a Tier A site due to its soil, which has a high infiltration potential, is publicly owned land, has overland slopes less than 10%, is not located near soil contamination sites, is close to Honby Channel, and is feasible from an engineering standpoint.

The park design will also incorporate above-ground nature-based solutions such as bioswales and will establish new native vegetation in Honby Channel. The bioswales are preferred for conveying on-site runoff, as opposed to a pipe network, because they convey flows at slower velocities, allow natural infiltration to occur, and naturally capture trash and pollutants in the water. The bioswales will also serve a practical purpose of conveying on-site runoff to a discharge point within the extended Honby Channel culvert, where it will join flows that are either diverted to the infiltration BMP or bypass the diversion to enter the Santa Clara River.

The new native vegetation that will be established in Honby Channel will serve a similar purpose in naturally treating the water conveyed through it. It is also desirable to enhance and restore the vegetation in Honby Channel in order to increase the hydraulic capacity of the Channel and provide a visually pleasing and educational amenity to the park. Approximately 1.6 acres of new vegetation are proposed for Honby Channel, including 22 distinct native species. The visibility of these natural water treatment features is helpful in educating the public about these important concepts.

3.2 MS4 Compliance

Please describe in detail how the project will support achievement of compliance with MS4 Permit including applicable TMDLs, role with Watershed Management Program, etc. Please clearly specify if this project is being developed as part of a Time Schedule Order for the MS4 Permit. SCW funds may be used for projects implemented pursuant to a TSO issued by the LA Regional Water Quality Control Board provided that, at the time the TSO is issued, the project is included in an approved watershed management program developed pursuant to the MS4 Permit:

The City of Santa Clarita is responsible for the discharges from the MS4 and compliance with TMDLs for the Santa Clara River, within its boundaries that are affected by the MS4. In order to establish a plan for meeting these requirements, the Upper Santa Clara River Watershed Management Program Group, which includes the City of Santa Clarita, LA County, and LA County Flood Control District, collaboratively developed an Enhanced Watershed Management Program (EWMP). The EWMP was developed to meet the MS4 permit requirements to protect the beneficial uses of the Upper SCR watershed receiving waters.

The Los Angeles County MS4 Permit (Order No. R4-2021-0105 / NPDES No. CAS004004), lists the TMDLs for Reach 7 of the Santa Clara River in Attachment M. Relevant pages from Attachment M have been included in the attachments to section 8.7 (attachment pages 80-83). Reach 7 is subject to one TMDL, which is bacteria, specifically constituent E. coli (see MS4 permit page M-1 and M-2).

The Upper Santa Clara River Watershed Management Group's Enhanced Watershed Management Program (EWMP), which aims to meet the requirements of the MS4 permit, lists Bacteria (constituent of E. Coli) and chloride as Priority 1 TMDLs, and also lists Trash, Copper, Mercury, and Cyanide as Priority 2 pollutants of concerns (see EWMP page ES-4). These TMDLs indicate a need to improve the water quality of both wet- and dry-weather flows before they reach the Santa Clara River. The EWMP has established two overarching categories of BMPs that are identified as watershed control measures (WCMs): Structural BMPs and Institutional BMPs (see EWMP page ES-4). The City has set a goal of instituting 285 ac-ft of structural BMPs by the year 2029 (see EWMP page ES-6).

According to the definition listed in the EWMP, the Via Princessa BMP is considered a Structural BMP and would contribute 30 ac-ft of storage to the 2029 milestone of 285 ac-ft. The EWMP also lists the Via Princessa project as a Tier A (highest priority) regional control measure (see page 5-7 of the EWMP). Nearly all of the pollutants associated with the 85th percentile storm event runoff volume reaching the diversion structure will be infiltrated, removing them from the Santa Clara River. This will include bacteria, copper, mercury, cyanide, trash, and other pollutants, which would normally make their way through the Santa Clara River, negatively impacting humans, plants, and animals.

This project is not being developed as part of a Time Schedule Order for the MS4 Permit.

3.3 24-hour Storm Capacity

Please enter information below regarding key parameters of the project's capacity. The Module will use those values to estimate the 24-hour capacity:

24-hour Storm Capacity Breakdown	
Effective Drawdown Rate:	4.92 in/hr
Stormwater Use During 24-hr Design Event:	0 gal

Please see attached supporting documentation for the "Effective Drawdown Rate.":

Attachments for this Section	
Attachment Name	Description
Effective Drawdown Rate Backup.pdf	Calculation for weighted average infiltration rate is shown on 5th page of this attachment.

Calculated 24-hour Storm Capacity	
Module-generated 24-hr Capacity:	37.8840 ac-ft
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate 24-hour capacity, and attach supplemental information with details of the methodology, assumptions and calculations.	N/A

3.4 Event-based Design Details

n this section, details regarding the project inlets and outlets are provided, along with estimates generated for the project design event. The event-based information is envisioned as basic estimates that would be generated during the project design, and will support review of the project details.

Estimated Total Inflow Volume during Design Event:

30.1 ac-ft

Describe the event used for project design. Describe the portion of the peak inflow that would be retained by the project through infiltration, capture, diversion, use, or other means. Tooltip for 'Treatment Description' under outlets:

85th Percentile, 24-hr storm duration (precipitation depth = 0.9 inches, per LA County). 100% of the peak inflow for the 85th percentile storm event will be retained by the project through capture, diversion, and infiltration.

Describe whether and how the 85th percentile is being captured/diverted. If not, is there opportunity to do so? If feasible but not incorporated, explain why. If not feasible, explain why.

85th percentile storm runoff is being captured by diverting the flow from the culvert running beneath Via Princessa Rd. The diversion structure will be sized to divert and convey the peak flow rate associated with the 85th percentile storm event. The intercepted flow then enters a pre-treatment device before entering the underground infiltration facility.

How many inches of stormwater does your project treat in 24 hours?

118.08 in

What rain event can the project treat?

The project will treat the 85th percentile, 24-hr storm event for the 997.8 ac watershed drainage area

The following tables detail inflow and outflow from the project during the design event:

Inlets	
Estimated Max Inflow Rate (cfs)	Total Inflow (ac-ft)
76.9 cfs	30.1 ac-ft

Outlets			
Estimated Max Outflow Volume (ac-ft)	Treated?	Treatment Description	Percent of Volume Treated (%)
0 ac-ft	Yes	Captured water is infiltrated into the ground, preventing 100% of pollutants in the captured water from reaching the Santa Clara River.	100 %

Describe the methods used to generate estimates:

The hydrology for the Honby Channel watershed was performed using HEC-HMS (v.4.8), a hydrologic modeling system developed by the U.S. Army Corps of Engineers. Land use and topography data was obtained from County GIS databases and was used as to develop inputs for the model. For the purposes of modeling, the watershed was split into 50 sub-watersheds and 45 sub-reaches (see page 2 of attachments for section 2.2). A summary of input parameters is shown on pages 31-36 of the attachments to section 2.4. After running the model through HEC-HMS, a hydrograph was obtained, from which the peak flow rate and runoff volume were derived. The peak flow rate and runoff volume are shown on page 37 of the attachments to section 2.4.

The volume of the infiltration facility was designed to accommodate 100% of the 85th percentile storm runoff volume, taking infiltration rate into account. This was determined by performing an inflow/outflow analysis of the BMP. The inflow consisted of the flow rates that make up the hydrograph. The incoming flow rate varies at each 5-min interval. The ouflow consisted of the volume of water that could infiltrate into the ground, per 5-min interval. This is a function of the infiltration rate of the soil (4.92 in/hr) and the footprint area of the BMP (2.1 ac). The required storage volume is then calculated from the difference between the inflow and outflow rates. Values for inflow, outflow, and storage volumes/rates are shown in 5-min intervals on pages 1-7 of the attachments to section 3.4. These values are also plotted on the graph (page 8 of the attachments to section 3.4). From this analysis, it was determined that the static storage volume of the BMP is equal to 11.0 ac-ft (peak storage volume), with a footprint of 2.1 ac, a maximum outflow rate of 10.3 cfs, and draining 30.1 ac-ft in 40.6 hrs.

The amount of inches infiltrated in 24 hrs was determined by multiplying the infiltration rate of the soil (4.92 in/hr) by a duration of time equal to 24 hrs. The product of those two values is equal to 118.08 in.

The outflow rate/volume is 0 because all captured water is infiltrated into the ground. Flows that exceed the BMP/diversion structure's capacity simply bypass the facility entrance, continuing on their normal flow path.

Attachments for this Section	
Attachment Name	Description
BMP Inflow-Outflow-Storage Analysis.pdf	

3.5 Long-term Performance

This section present details of the calculation of long term (10-year) water quality benefit for Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria. These estimates were either generated by the Module using a 10-year hourly simulation with the Watershed Management Modeling System (WMMS), or generated by the Project Developer.

The following tables present selected primary and secondary pollutants and calculated reductions for water quality benefit per Section A.1.2 (Water Quality Benefit) of SCW Project Scoring Criteria.

Note: these estimates are based on the hourly 10-year WMMS simulation performed by the Module, or as estimated by the Project Developer.

Primary Pollutant	
Primary Pollutant	Bacteria
Reduction Method used for Scoring	Method 2 (% Load Reduction)
Justification for selecting Primary Pollutant	Listed by MS4 permit and EWMP as a TMDL for Reach 7 of Santa Clara River
Calculated 10-year Pollutant Reduction	89.1
Use Project Developer estimate instead?	No
Own Value	N/A
Justification for using own value	N/A

Secondary Pollutant	
Secondary Pollutant	Total Copper
Reduction Method used for Scoring	Method 2 (% Load Reduction)
Justification for selecting Secondary Pollutant	Listed by EWMP as a TMDL for Reach 7 of the Santa Clara River.
Calculated 10-year Pollutant Reduction	96.3
Use Project Developer estimate instead?	No
Own Value	N/A
Justification for using own value	N/A

The following table presents calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.

Note: this output includes all pollutants and methods, including those not selected as Primary or Secondary for scoring.

Pollutant Name	Method 1 (% Concentration Reduction)	Method 2 (% Load Reduction)	Method 3 (% Exceedance Reduction)
Total Zinc	0.0 %	96.6 %	N/A
Total Copper	0.0 %	96.3 %	N/A
Total Lead	0.0 %	91.2 %	N/A
Total Nitrogen	29.9 %	98.7 %	N/A
Total Phosphorous	0.0 %	98.1 %	N/A
E.coli	0.0 %	89.1 %	N/A
Toxics	N/A	N/A	N/A
Chloride	N/A	N/A	N/A
Trash	N/A	N/A	N/A
N/A = Modeling results not available from Projects Module, must be manually generated by user			

The following table presents inflow and outflow details for calculated water quality benefit achieved by the project based on the hourly 10-year WMMS simulation performed by the Module, for all the simulated pollutants.

Note: this output includes pollutants not selected as Primary or Secondary for scoring, and reduction methods not selected for scoring.

Metric	Runoff from Capture Area	Minimally Treated Outflow from Project	Inflow into Project Inlet	Outflow from Project Outlet	Reduction by Project	% Reduction by Project
Runoff Volume (ac-ft)	1695.154	30.973	1683.147	30.973	1652.174	98.160 %
Total Zinc (ug/L)	164.530	299.990	160.730	299.990	-139.260	-86.642 %
Total Zinc (lbs)	758.438	25.268	735.693	25.268	710.426	96.565 %
Total Copper (ug/L)	35.400	69.720	34.500	69.720	-35.220	-102.087 %
Total Copper (lbs)	163.199	5.872	157.906	5.872	152.033	96.281 %
Total Lead (ug/L)	15.110	67.170	14.100	67.170	-53.070	-376.383 %
Total Lead (lbs)	69.664	5.658	64.537	5.658	58.880	91.233 %
Total Nitrogen (mg/L)	5.838	4.097	5.845	4.097	1.748	29.899 %
Total Nitrogen (lbs)	26910.034	345.103	26752.145	345.103	26407.042	98.710 %
Total Phosphorous (mg/L)	0.623	0.630	0.622	0.630	-0.008	-1.356 %
Total Phosphorous (lbs)	2869.936	53.068	2845.198	53.068	2792.130	98.135 %
E.coli (#/100mL)	1.425E+004	8.096E+004	1.365E+004	8.096E+004	-6.732E+004	-493.281 %
E.coli (#)	2.980E+014	3.093E+013	2.833E+014	3.093E+013	2.523E+014	89.082 %
Toxics	N/A	N/A	N/A	N/A	N/A	N/A
Chloride	N/A	N/A	N/A	N/A	N/A	N/A
Trash	N/A	N/A	N/A	N/A	N/A	N/A
N/A Modeling results not available from Projects Module, must be manually generated by user						

4 WATER SUPPLY BENEFITS

This section provides an overview of project elements related to water supply benefits, including calculations used for Section B (Significant Water Supply Benefits) of SCW Project Scoring Criteria.

4.1 Water Supply Needs

Please describe any known or perceived Water Supply needs of the watershed area:

Santa Clarita is unique in that it relies on groundwater for approximately half the community's domestic water supply. The groundwater basin is an important resource to the community and must be managed properly in order to provide for future generations and in continued drought conditions. The Eastern Subbasin is the sole source of local groundwater for urban water supply in the Santa Clarita Valley. The Eastern Subbasin is comprised of two aquifer systems, the Alluvium and the Saugus Formation. The Alluvium generally underlies the Santa Clara River and adjacent areas, including its several tributaries, to maximum depths of about 200 ft; and the Saugus Formation underlies most of the Upper Santa Clara River area, to depths of at least 2,000 ft. The Santa Clarita Valley Water Agency's 2020 Urban Watershed Management Plan (UWMP), which is released every 5 years, shows that the Alluvial Aquifer supplied 7,571 ac-ft of water to the community in 2020. In comparison, the Saugus Formation supplied 9,761 ac-ft. (pages 4-21, 4-25, & 4-26 of SCVWA 2020 UWMP, included in the attachments to section 8.7).

The Alluvium system is particularly important because the water stored in this layer is relatively close to the surface and easy to access; however, due to the high hydraulic conductivity of these soils, infiltrated water quickly migrates to points further down-gradient. This, combined with the ongoing drought impacting southern California, has caused numerous production wells in this area shut down periodically, when groundwater levels drop below the operation levels of the wells. Production wells that are not shut down have reduced pumping capacities when lower groundwater levels occur in dry periods (page 4-29 & 4-35 of SCVWA 2020 UWMP, included in attachments to section 8.7). The Via Princessa Park and BMP site overlies the East Groundwater Subbasin, specifically over a shallow layer of alluvium underlain by bedrock. Groundwater elevation records in this area show volatile changes in the water levels over time (See GSI groundwater modeling study, pages 38-48 of attachments to section 2.4).

Additionally, as groundwater moves further down-gradient, it eventually is conveyed through a layer of alluvium over the Saugus Formation. The Saugus Formation is a bowl-like feature beneath the Santa Clara River which has several deep storage layers. Some groundwater being conveyed through the alluvium layer above the Saugus Formation is lost through seepage into this 'bowl'. While many production wells exist within the Saugus Formation, it has been found that the deepest layers of the aquifer contain older, more contaminated water that is more difficult to treat. Additionally, the groundwater levels above the Saugus Formation tend to be closer to the ground surface. During high groundwater conditions, the Eastern Subbasin has the potential to lose groundwater to surface flow, which quickly crosses the Los Angeles County Line downstream (Page ES-4 of the Santa Clara River Valley East Groundwater Subbasin GSP, included in attachments to section 8.7). Water that is lost to downstream counties or infiltration in the Saugus Formation must be made up through the use of alternate water supplies, such as imported water, which tends to be more expensive.

Please describe how your project will address this need and/or achieve similar desired outcomes within the watershed area:

This issue of unstable groundwater levels in the upper portions of the East Groundwater Subbasin has been identified by the Santa Clarita Valley Groundwater Sustainability Agency (SCVGSA) in the past. Recommended solutions have included infiltrating more captured stormwater runoff in the upper portions of the Eastern Groundwater Subbasin (page 9-19 of SCVGSA Groundwater Sustainability Plan (GSP), included in attachments to section 8.7). The SCV Groundwater Sustainability Agency has highlighted the importance of BMPs in supporting sustainability and water conservation (page ES-23 of SCVGSA GSP, included in attachments to section 8.7). The proposed project site has been identified by the SCVGSA as an optimal location for off stream recharge (page 9-20 of SCVGSA GSP). The proposed infiltration BMP at the Via Princessa Site will help the Water Agency meet their goals of sustainable basin management by infiltrating the 85th percentile runoff from the Honby Channel watershed.

The groundwater system was modeled by GSI Water Solutions, Inc., taking into account the effects of the proposed infiltration facility. The model covered a period of time from January 2006 to January 2008. For months with recorded rainfall, the volume that would have been captured and infiltrated by the proposed facility was calculated and entered into the model. The results from this analysis showed that, although the 85th percentile runoff captured by the facility would have eventually entered the Eastern Subbasin further downstream, infiltrating it at the location of the proposed BMP would result in an approximately half a foot increase in groundwater levels at three nearby production wells. Although this would probably not impact the operation procedures at those wells, it represents an increase in the amount of locally available water supply through increased yield. GSI's evaluation of the project's effects on groundwater mentioned that multiple stormwater infiltration projects together could create a greater water supply benefit in this area of the Eastern Subbasin, without materially affecting groundwater production at water supply wells further downstream. The Canyon Country Community Center, located across the river from the Via Princessa site, is another, similar regional infiltration facility. The benefits of adding an infiltration BMP at Via Princessa will be added on to the benefits from the Canyon Country facility. Similarly, future projects in this area will continue adding on to the water supply benefits for the Eastern Subbasin.

Please describe the process to determine the proposed project scope. If you are utilizing Nature-Based Solutions (natural processes or nature-mimicking strategies) to address the specific need, please include a discussion of how Nature-Based Solutions was considered and justification for the proposal as is:

The known problems/opportunities presented by the Eastern Santa Clara River Valley Groundwater Subbasin greatly influenced the selection of the Via Princessa site for this project. This location was ideal to implement a regional infiltration BMP that could begin addressing the issues involved with managing the groundwater levels and production rates, as identified by the EWMP and SCVGSA GSP. In determining what type of application could best address these issues, it became clear that an underground infiltration BMP, which is a nature mimicking strategy, would be the most effective option . An underground infiltration BMP is able to infiltrate more water within a smaller footprint than above-ground basins or LID type facilities (i.e. manmade wetland, rain gardens, bio-swales, etc.), thereby having a greater impact on groundwater levels given the allowable space. Additionally, an underground infiltration facility provides the option of multiple uses for the same space, such as upland/meadow planting and a native seed bank on top. Given these factors, it was determined that the best way to address the issues facing the Eastern Groundwater Subbasin was to construct an underground infiltration BMP.

In addition to the BMP, the soils on-site will be enhanced through the use of soil amendments and new native drought resilient plants & trees. Creating well-connected and self-sustained natural landscapes with healthy soils and appropriate vegetation will ensure that the park drains adequately and that water can infiltrate easily into deeper layers. Healthy soils also provide benefits like greenhouse gas sequestration, erosion prevention, water retention, etc.

4.2 Water Supply Nexus

Please describe and clearly justify the nexus between water supply and the stormwater and/or urban runoff that is captured/infiltrated/diverted by the Project:

The water that will be diverted, captured, and infiltrated by the proposed infiltration facility will consist of runoff (dry- and wet-weather) from the Honby Channel. The Honby Channel watershed is approximately 998 ac, which is a little over 50% developed (According to land use. Specifically, 36% of the watershed area is impervious). The project will divert the 85th percentile flow rate/volume, removing trash and other pollutants associated with urbanization.

The Via Princessa project site is located in an area that has been identified by the Water Agency and Groundwater Sustainability Agency as having a high benefit to infiltrating water, since the alluvial layer has available storage capacity and the nearby production wells have periodically been taken offline due to low groundwater levels. The project will infiltrate this water further upstream, which will increase groundwater levels at 3 nearby production wells by approximately 1/2 a foot (see GSI groundwater modeling analysis included in attachments to section 2.4). The Canyon Country Community Center, located across the river from the Via Princessa site, is another, similar regional infiltration facility. The benefits of adding an infiltration BMP at Via Princessa will be added on to the benefits from the Canyon Country facility. Similarly, future projects in this area will continue adding on to the water supply benefits for the Eastern Subbasin.

Does this project capture water for onsite irrigation use?

No

Description of onsite use by the project:

N/A

Does this Project capture water that will be used for water recycling by a wastewater treatment facility?

No

Please see concurrence from the local sanitation Districts. Letter or any type of correspondence that establishes concurrence.

Description of water recycling by the project:

N/A

Is the project connected to a managed water supply aquifer?

Yes

If Yes, managed Aquifer Name:

Santa Clara River Valley East Subbasin

If this project is augmenting groundwater supply, please provide confirmation that the agency managing the groundwater basin concurs with the added benefit.

Attachments for this Section

Attachment Name	Description
SCV-GSA Support Letter Via Princessa.pdf	

Is the project claiming to capture "first flush" flows?

Yes

If Yes, Please demonstrate the benefit of capturing these limited events, including the anticipated capture amount, other factors impacting the scale of the beneficial use, detailed discussion of downstream facilities/projects that are not suited to capture first flush flows, the intended beneficial use, and clear justification of how the proposed efforts to capture first flush flows will not have any adverse impacts:

The "first flush" typically refers to the runoff from the first storm(s) of the rainy season. During extended periods without rain, pollutants such as oil, heavy metals, and trash accumulate within an urbanized watershed, specifically on roads and impervious surfaces. The first storm of a season carries many of these pollutants to downstream water bodies and studies have shown that pollutant concentrations are higher in "first flush" runoff than in the runoff from storms later in the season. As such, capturing the "first flush" flows will result in removal of higher concentration of pollutants from downstream water bodies.

The Via Princessa project is designed to divert, capture, and infiltrate up to the 85th percentile storm runoff volume from the Honby Channel watershed (runoff volume of 30.1 ac-ft / peak flow rate of 77 cfs), which will likely include the "first flush" flows. Research by Thomas R. Schueler (see "Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs", 1987) has shown that there is a point of diminishing returns between percent capture of annual runoff and pollutant removal effectiveness. Most programs in the state of California that target the "first flush" volume have regulations coalescing around treatment of the 85th to 90th percentile storm, also known as the Water Quality Volume. Some stormwater control measures that are designed for water quality treatment also have benefits for reducing peak flows and promoting infiltration, but their primary reasons for use are linked to the local water quality requirements, which reflect goals of protecting aquatic life, drinking water resources, and minimizing risk of disease resulting from contact with pathogens in water bodies.

4.3 Benefit Magnitude

Project Scoring Criteria Section B2 is based upon estimates of annual average water supply benefit. Water supply benefit can include, but is not limited to, water diverted to a separate groundwater recharge facility, into a water treatment plant, to a sanitary sewer to be converted into recycled water, etc. This section provides documentation of estimates of annual average water supply benefit.

Average dry weather inflow to project:

2 cfs

Describe the methods used to estimate average dry weather inflow to the project:

Based on 4 field observations (Nov 2021, Jan 2022, February 2022, March 2022, and May 2022), a constant presence of dry weather flow in the Honby Channel culvert has been observed. Depth of flow in the culvert on January 2022 was 10 inches and depth in the culvert in March 2022 was 13 inches. The water at the downstream end of the culvert was noted as being stagnant. However, a positive flow rate was observed at the upstream end of the culvert, where water from the portion of Honby Channel traveling through the golf course continues downstream. Based on these visual observations, the approximate depth of flow, and the width and slope of the channel, it was estimated that 2 cfs of dry weather flow is present in Honby Channel. As part of the diversion design, a portion of this will continue downstream, past the BMP inlet, in order to sustain the native vegetation that will be planted in Honby Channel. Therefore, 1cfs is proposed to infiltrate in the BMP and 1cfs is proposed to continue downstream.

Photos from the field visit to Honby Channel are included in the attachments to section 8.7.

The following tables present calculated annual inflow the project.

Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.

Module-generated annual average inflow to project:	1683.147 ac-ft
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate water supply inflow values	N/A
Supporting PDF	See attached PDF if applicable.

The following tables present calculated annual average capture by the project, which is used for the Section B2 scoring calculation (Benefit Magnitude of SCW Scoring Criteria).

Note these estimates are based on an hourly 20-year hourly WMMS simulation performed by the Module, or as estimated by the Project Developer.

Module-generated annual average capture for water supply:	1652.174 ac-ft
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate water supply benefit	N/A
Supporting PDF	See attached PDF if applicable.

4.4 Cost Effectiveness

Project Scoring Criteria Section B1 incorporates life-cycle costs. The cost-effectiveness for water supply benefit is calculated from other sections in the Module. The calculation for B1 scoring is based on a numerator of life-cycle cost (from Design Elements > Cost) and a denominator of annual average benefit magnitude (from Water Supply > Benefit Magnitude).

Module-generated water supply cost-effectiveness:	$ 695.06 per ac-ft
Use Project Developer estimate instead?	No
Custom Value specified by User:	$ N/A
Justification	N/A
Supporting PDF	See attached PDF if applicable.

5 COMMUNITY INVESTMENT & LOCAL SUPPORT BENEFITS

5.1 Community Investment & Local Support Needs

Please describe any known or perceived Community Investment needs of the watershed area:

Parks:
The City of Santa Clarita's Parks and Recreation 5-year plan included two separate community surveys along with a series of focus group meetings consisting of community stakeholders. The results of this survey showed that residents want an increase in access and opportunities for passive and active recreational programming in designated Open Space areas.

Additionally, the Parks, Recreation, and Open Space Master Plan Update (August 2008) identified potential sites within the City that could be converted into parks and other recreational facilities. This study solicited community input through three (3) workshops, stakeholder interviews, community focus groups, sports organization survey, community-wide telephone survey, and a recreation facility demand/needs analysis. The feedback received from the community included a desire to expand or renovate existing parks, build more multi-use fields, and acquire vacant or open space land. The neighborhood park service area analysis in this study also found that the area that the Via Princessa park site is situated in is a service gap area, which can be addressed by adding a new facility.

The closest park to the proposed project site is C4 Park (Canyon Country Community Center) , approximately 1.5 miles away from the project site, on the north side of the Santa Clara River. The closest park to the proposed project site on the south side of the Santa Clara River is the Santa Clarita Sports Complex, which is approximately 3.3 miles away. This leaves a large area of the surrounding community outside of a 1/2 mile radius of any park, making it more difficult for them to have access to recreational amenities without a vehicle. According to California Fact Finder, 4,136 community members live within a 1/2 mile radius of the project site, including 351 who are living in poverty (see attachment page 3 of section 8.7). 71 households within this same area area do not have access to a car. Additionally, there are four schools located less than 2 miles away from Via Princessa. According to LA County's 2016 Park Needs Assessment, communities surrounding Via Princessa to the north and south are identified as having a park need rating of "Moderate", "High", and "Very High", with a majority of areas surrounding the park being categorized as "High".

Shade/Trees:
The project site currently contains approximately 3% tree canopy coverage area, according to a dataset compiled by the Tree People organization. This is 15% lower than the LA County Average (which is 18%). Summer temperatures in Santa Clarita regularly exceed 100 degrees. Climate change models tell us that peak temperatures will increase, which will also increase the number of heat emergencies. It is becoming increasingly important to provide more opportunities for shade relief for members of the community who are outdoors during these extreme events.

Public access to waterways:
While the north bank of the Santa Clara River has a Class I bike path/walking trail, the south bank currently has limited access to the public. This means communities on the south side of the river have less access to waterways than communities to the north.

Restoration of Habitats:
The project site is identified as a Significant Ecological Area (SEA), as part of the Santa Clara River within the Incorporated City Limits of Santa Clarita. The SEA area will receive additional evaluation during the environmental studies and will be addressed accordingly in the CEQA document. The site

does not lend itself to vegetation that would grow in wetlands, but could benefit from a removal of invasive plant species that have spread throughout the site, especially in Honby Channel. A small but continuous source of dry weather flow has been observed in Honby Channel, which has supported numerous invasive species of trees and shrubs. The location of these invasive species is also ideal for spreading into other areas of the River, via water flowing to downstream points or birds/small animals carrying seeds. The Santa Clara River has unique species found nowhere else in southern California. Protecting and multiplying these species would help increase the diversity of native plants and habitat in the area.

Please describe how your project will address this need and/or achieve similar desired outcomes within the watershed area:

Parks:
The proposed park at Via Princessa will create approximately 15 acres of new park in a location that will be accessible to more schools, residents of nearby apartments, senior living facilities, mobile home parks, churches, and disadvantaged community members who are currently in need of parks. The park will address the need/desire of the community for more active and passive recreation opportunities, which has been documented in past studies and surveys performed by the City. Studies have also shown that active and passive recreation opportunities and park correlate to a healthier community, both mentally and physically. The park will provide active and passive recreation opportunities through the use of 4 multi-use fields, trails, community gathering areas, playgrounds, and other amenities. The park will be within a 1/2 mile radius (walking distance) of 4,136 community members, including 351 members living in poverty, 71 households without access to a car, and 843 members under the age of 18. The park will also be accessible to those using the Metrolink train, which has a station at the proposed project location.

Shade/Trees:
The proposed project will significantly increase the amount of shade on the site. The site currently has approximately 3% tree coverage. The project proposes to include 309 new trees, 19 shade structures, 4.6 acres of native, drought-resilient vegetation in the recreational areas of the park, and 1.6 acres of native, drought-resilient vegetation in Honby Channel. This increased shade will lower temperatures for park visitors and also increase the quality of the soil and habitat. Additionally, over a 40-yr period, it is estimated that the proposed trees will sequester 1,054,961.80 lbs of carbon (see pages 7-8 of attachments to section 5.2).

Public Access to Waterways:
The creation of a park at Via Princessa will provide access to the Santa Clara River for communities living on the south side of the river, as the park is proposed to be built adjacent to the river's flow path. It should also be noted that, currently, the railroad creates a barrier to accessing the river from the southern communities. The creation of a park at Via Princessa will provide access underneath the railroad, opening up a safe path to the river. Additionally, a future Class II bike trail will be implemented on the north bank of the Santa Clara River, connecting from Sierra Highway. Visitors of the proposed park will be able to use this trail to access the Santa Clara River and Honby Channel. Many passive recreation opportunities are also proposed at the park, which will overlook the Santa Clara River and Honby Channel and will include educational signage.

Restoration of Habitats:
The proposed project at Via Princessa will remove invasive plant species and enhance/expand the native, drought tolerant plants that exist on the site. The outlet of the Honby Channel culvert that travels beneath Via Princessa Rd. and the railroad tracks holds the highest density of vegetation on the property due to it being a consistent source of water. Many non-native and invasive species of vegetation exist here, which are supported by a small but consistent source of dry weather flow that is conveyed through Honby Channel. This vegetated area will be expanded and incorporated into proposed improvements at the park, while naturally treating runoff that enters the Santa Clara River. The channel improvements

will incorporate native vegetation that will support small wildlife, provide shade, create an aesthetically pleasing centerpiece of the park, and serve as an educational piece to the public, with illustrative signage describing the channel's purpose and function. Approximately 1.6 acres of new vegetation are proposed for Honby Channel, including 22 distinct native species. The recreational areas of the park will also be landscaped with native, drought-resilient plants, including 34 distinct native species.

Please describe the process to determine the proposed project scope. If you are utilizing Nature-Based Solutions (natural processes or nature-mimicking strategies) to address the specific need, please include a discussion of how Nature-Based Solutions was considered and justification for the proposal as is:

Because the site is currently undeveloped and does not have any impervious areas (excluding the parking lot), there will be a net addition of impervious areas resulting from the project. The parking lot itself will be retrofit to add more parking spaces to accommodate park visitors, as well as increased trees and vegetation to provide shade and a pleasing aesthetic. Runoff from the parking lot will also be directed to the infiltration BMP, encouraging natural processes and removing pollutants from the flow path to the Santa Clara River. Overall, impervious areas will be used as little as possible in the park, but some will be necessary in order to provide safe walking trails that are accessible to all members of the community, and to meet ADA requirements. Use of nature-mimicking pervious surfaces will be used as much as possible in order to minimize increases in surface runoff that might result from the development of the site.

Although the current site is undeveloped and does contain some natural vegetation, the vegetative cover will be significantly improved by incorporating more native, drought tolerant plant/tree species that attract wildlife and provide shade for visitors. This is what the park will aim to accomplish through a carefully thought out landscape plan. Larger shrubs and trees will significantly improve the shade cover at the site, providing a more pleasant experience for visitors on hot days, as well as creating conditions where varied plant types can thrive, which require less direct sunlight to grow. The 309 added trees and 4.6 acres of added plants/shrubs (not including new plants in Honby Channel) will create a well-connected and self-sustained natural landscape with healthy soils and appropriate vegetation.

The proposed Honby Channel improvements will enhance and expand the existing vegetation growing at the culvert outlet. The channel improvements will not only encourage riparian habitat on the site, but will also provide a natural treatment processes for the water before it enters the Santa Clara River. 1.6 acres of new plants will be added in the Channel, which will include 22 distinct native species. The added vegetation in the recreational areas of the park will include 34 distinct native species.

Bioswales will be incorporated into the park, which will collect and convey on-site runoff to Honby Creek. Bioswales are the preferred method for capturing and conveying the on-site runoff, as they result in lower flow velocities than traditional stormwater features, such as v-ditches or pipe networks. Bioswales also allow some of the conveyed water to infiltrate into the ground and provide natural treatment processes to the water they convey. The on-site bioswales will be sized for the 85th percentile runoff, at a minimum. The treatment provided by the bioswales will reduce pollutants being transported to downstream water bodies, such as Honby Channel and the Santa Clara River. Reduction/removal of pollutants in this surface water is important in protecting the health of the community.

5.2 Community Investment

This section provides an overview of project elements related to community investment benefits, which are used in calculations for Section C (Community Investment Benefits) of SCW Project Scoring Criteria.

The following table details the project's community investment benefits:

Community Investment		
Investment Type	Applicable?	Detailed Description
Does this project improve flood management, flood conveyance, or flood risk mitigation?	No	N/A
Does this project create, enhance, or restore park space, habitat, or wetland space?	Yes	This project will create 15 acres of new public park in a community that has been identified as being in need of parks. The project will also incorporate the enhancement and expansion of vegetation at the Honby Channel outlet (1.6 acres of cover, including 22 distinct native species). The park improvements will also include a landscape plan, expanding the native vegetation on-site and incorporating trees and shrubs (309 new trees, 4.6 acres of new vegetative cover, not including multi-purpose fields. New vegetation will include 34 distinct species).

Does this project improve public access to waterways?	Yes	The site is located adjacent to the Santa Clara River, just south of its flow path, and is also immediately east of the Honby Channel. Park visitors will have access to the river and channel where, previously, only access to the north bank of the Santa Clara River existed. The railroad alignment currently restricts access to the southern banks of the river. The creation of the park will grant safe access to the river for members of this previously excluded community. The park will become accessible to more members of the community with the future planned Class II bike trail on the north bank of the Santa Clara River. The park is also located within a 1/2 mile radius of 4,136 community members, which includes 351 members living in poverty, 843 members younger than 18 years old, and 71 households without access to a car).
Does this project create or enhance new recreational opportunities?	Yes	The park will provide many new active and passive recreational features to the local community, which has been identified as having a need for parks. The park is under 2 miles away from 4 schools, providing a convenient location for after school sports and activities. Additionally, because the site is located next to the Via Princessa Metrolink station, the park will be available and convenient to use for anyone who rides the train. The park site will include 4 multipurpose fields, playgrounds/play areas, educational features, and 4,030 LF of new walking trails.
Does this project create or enhance green spaces at school?	No	N/A

Does this project reduce heat local island effect and increase shade?	Yes	The project will include some impervious surfaces, in order to provide safe walking trails and access to all members of the community. However, pervious surfaces will be used wherever possible. Additionally, shade will be increased on the site by increasing the number and variety of drought tolerant plants and trees in the landscaping plan (309 new trees, 19 shade covers, and a total of 6.2 acres of new plants and shrubs, not including the multipurpose field area).
Does this project increase shade or the number of trees or other vegetation at the site location?	Yes	The site is currently estimated to have 2.9% shade cover, which is 15.1% lower than the LA County average. The addition of a landscape plan with the proposed park features will increase the variety of native vegetation on the site and provide increased amounts of shade (309 new trees, a total of 6.2 acres of new plants and shrubs, not including the multipurpose field area). The added trees will sequester an estimated 1,054,961.80 lbs of carbon.

Please see attached Upload Optional Supporting Documentation:

Attachments for this Section	
Attachment Name	Description
Shade Canopy Map - LA County.pdf	
Schools Map.pdf	
Plant Palette.pdf	
Greenhouse Gas Mitigation Calcs.pdf	

5.3 Local Support

Please describe any prior outreach and engagement conducted for this project:

There have been many engagement opportunities regarding the Via Princessa Park prior to this Measure W application. In general, the City has solicited input from the community regarding the needs and desires for potential park sites around the City, through the Parks and Recreation 5-year Plan (2020) and the Parks, Recreation, and Open Space Master Plan Update (August 2008). The 5-year plan included two separate community surveys along with a series of focus group meetings consisting of community stakeholders, which showed that residents want an increase in access and opportunities for passive and active recreational programming in designated Open Space areas. The Master Plan Update solicited community input through three (3) workshops, stakeholder interviews, community focus groups, sports organization survey, community-wide telephone survey, and a recreation facility demand/needs analysis. The feedback received from the community showed a desire to expand or renovate existing parks, build more multi-use fields, and acquire vacant or open space land. A neighborhood park service area analysis for these efforts study also found that the area that the Via Princessa park site is situated in is a service gap area, which can be addressed by adding a new facility such as the one proposed.

On October 25, 2016, the City acquired the property with the intent of building a park at the City Council meeting. The City Council awarded a contract for master planning assistance with the proposed Via Princessa Park project on November 21, 2021. Both meetings were publicly noticed, and the staff reports clearly stated that the intent was to build a park at the site. Public comment opportunities were available during both meetings. Project management staff have been in contact the with Fernandeño Tataviam Band of Mission Indians several times to date about the concept proposal and the site. Staff has discussed the project with the Tribal Historic and Cultural Preservation Officer on September 13, 2021 and September 20, 2021. More recently there was an update on the project provided on April 4, 2022.

Project-specific engagement was performed for the nearby communities. This included ongoing conversations with the site manager at Cordova Estates, which is the mobile home park that borders the project site on the East. The Cordova Estates community is part of a DAC tract and will be closest in proximity to the proposed park and supports the project. The City has received a letter of support from the Cordova Estates community.
The City also hosted an open house event on July 14, 2022 to garner feedback from the community. As a part of the promotion, for those who were unable to attend the open house, a simple survey about the park was provided in a QR Code and a website associated with the event flyer in both English and Spanish. The open house event was held at the nearest community center to the park, the recently built Canyon Country Community Center. There were children's activities to support parents who wanted to attend. The event was promoted on several social media sites, using press releases, and through direct invitation. Those directly invited include

- Cordova Estates Mobile Home Park
- Multi-purpose field user groups
- TreePeople
- WASC members

There were about 40 attendees to the open house. The vast majority of the open house participants were interested in having additional pickleball courts, which was reflected in the surveys and event materials. Several people made comments about the need for additional security at the site, the need for more running and walking opportunities, appreciating the stormwater infiltration project, opportunities to enjoy nature, bike path connectivity with the existing city network, and improved recreational opportunities for families, and need for shade. Of the participants, 5 people provided a letter of support. Around 150 people participated in the online survey. The survey provided a more diverse response. The top five responses to the survey question “What activities would your family be interested in at the new City park?” included walking, quiet space to enjoy nature, gatherings/picnics, children’s playground, and various sports that require multi-purpose fields.

Please describe the Outreach Plan for this project moving forward:

The proposed Via Princessa Park project will have a long-term design process prior to construction and will include a Public Participation Plan. In 2020, the City of Santa Clarita updated the Public Participation Plan policy to assure adequate public participation for residents of Santa Clarita in project programs and issues of importance.

The policy states that every major project is provided an opportunity for two-way communication between residents, local organizations and the City and the City Council, and to assure that the City Council has adequate public input on projects and items before them. This policy will be merged with the Safe Clean Water requirements for a project with this level of funding.

As a project and a decision that will significantly affect the groups and neighborhoods surrounding the proposed Via Princessa Park, the City will prepare a public participation plan for review of the City Manager that will address the following. The City will:
•Build on the previous consensus building in surveys and engagement.
•Follow a decision-making process which is visible and build credit with the public by following up with the participants about what can and can’t be included in
the project
•Look for ways other than the current project to meet expressed needs if the project cannot accommodate the request

This effort will include more focused discussions with identified user groups, discussions on design team considerations of input, and additional City Council meetings. The City will also provide opportunity at the River Rally event in September to focus on the water quality elements of the project. The City will also be working with the watershed coordinator, and the USCR IRWM stakeholder group that will focus on the water quality and water supply discussions.

Specific to Cordova Estates, and consistent with previous construction projects, the City will work to have additional, direct communication with the Cordova Estates residents on the park elements. Staff anticipates at least one meeting at the park to discuss concerns. There will also be a communication process for during construction to address concerns and issues.

Please see attached for Outreach and Engagement Plan:

Does this demonstrate strong local, community-based support?

Yes

The following table details the support by local, community-based organizations for the project (also see attachments)**:**

Local Support		
Organization Name	Description	PDF

Cordova Estates Property Manager	The property manager of the Cordova Estates mobile home park, which is a disadvantaged community and closest in proximity to the project site, have been consulted with regarding the project and have provided their support of the project.	Cordova - Via Princessa Support Letter.pdf
Individual Members of the Community	Attendees of the July 14th, 2022 open house, were invited to write letters of support for the project, which are included in this attachment.	Community Letters of Support.pdf
Individual Members of the Community	Details from the July 14, 2022 open house meeting are included in this attachment, including (1) announcement flyer, (2) social media and news outlet postings, (3) attendance sheet, (4) survey results, and (5) photos.	July 14 Meeting Details.pdf

6 NATURE-BASED SOLUTIONS

This section provides an overview of project elements that leverage nature-based solutions, which are used in calculations for Section D (Nature-Based Solutions) of SCW Project Scoring Criteria.

Does this project implement or mimic natural processes?

Yes

Natural Processes Description:

The infiltration BMP increases the retention volume of stormwater flows, up to 30.1 ac-ft for each storm event, and also reduces the peak flow rate traveling to downstream areas (nature mimicking strategy).

4.6 acres of new vegetation will be added to the park recreational areas, not including the multi-purpose fields. The park landscape plan will include 34 distinct native species and 309 trees.

1.6 acres of new vegetation will be added to the Honby Channel area, including 22 distinct native species, restoring the riparian habitat in this area.

Bioswales will be incorporated into the on-site drainage plan, providing natural treatment to flows entering Honby Channel.

Does this project utilize natural materials?

Yes

Natural Materials Description:

Most of the park site will be made up of unpaved, pervious materials. Some impervious surfaces will be necessary in order to provide safe access to the park for all members of the community. 6.2 acres of new vegetation will be included in the landscape plan, not including the multi-purpose fields. 309 new trees will also be planted. Usage of pervious surfaces will be maximized as much as possible, relying predominantly on soils, pavers, and other permeable materials. Naturally derived compost/organics will be used in vegetated areas to enhance the soils.

Description of how nature-based solutions are utilized to the maximum extent feasible. As appropriate, please include details such as a description of benefits achieved, plant palette, number of plant species, soil amendments, ground cover, removed impermeable area, etc. If nature-based solutions are not utilized to the maximum extent feasible, include a description of what options where considered and why they were not included.

The underground infiltration BMP component of the project incorporates nature-mimicking strategies by increasing the amount of water infiltrating into the Eastern Santa Clarita Valley Groundwater Subbasin through the soil. The groundwater basins beneath urbanized areas typically experience far less recharge than naturalized areas due to the large amounts of impervious surfaces that are utilized. Projects like the Via Princessa Infiltration BMP help restore the groundwater basin to pre-urbanization conditions. The Via Princessa Infiltration BMP will infiltrate up to 30 ac-ft for each storm event. This, in turn, can help reduce the peak flow rate of surface water traveling to downstream areas.

Overall, impervious areas will be used as little as possible in the park. Some impervious surfaces will be necessary in order to provide safe walking trails that are accessible to all members of the community; however, use of nature-mimicking pervious surfaces will be used as much as possible in order to minimize increases in surface runoff that might result from the development of the site. 4.6 acres of new vegetation will be planted in the recreational areas of the park, not including the multi-purpose fields (34 distinct native species). 306 new trees will sequester approximately 1,054,961.80 lbs of carbon.

The proposed improvements to the Honby Channel will enhance and expand the existing vegetation growing at the culvert outlet. The channel improvements will not only improve habitat on the site, but will be providing natural treatment processes for the water entering the Santa Clara River. 1.6 acres of new vegetation will be added to Honby channel, including 22 distinct species.

Approximately 3% of the site currently has tree cover, providing little to no relief to visitors in the sun. The proposed project will add 309 trees and 19 shade covers, which will provide a significant reduction of heat island effects.

The bioswales will capture and convey the on-site runoff to Honby Channel. Bioswales are preferable to pipes or concrete v-ditches, as they result in lower flow velocities than traditional stormwater features, such as v-ditches or pipe networks. Bioswales also allow some of the conveyed water to infiltrate into the ground and provide natural treatment processes to the water they convey. The on-site bioswales will be sized for the 85th percentile runoff, at a minimum. Runoff from the parking lot area will also be treated, through being directed to the infiltration facility. The treatment provided by the bioswales and infiltration facility will reduce pollutants being transported to downstream water bodies, such as Honby Channel and the Santa Clara River. Reduction/removal of pollutants in this surface water is important in protecting the health of the community.

The following table details the impermeable area removed by the project:

Removed Impermeable Area by Project	
Pre-Project Impermeable Area:	Post-Project Impermeable Area:
4.75 ac	5.77 ac

Please see attached supporting documentation of impermeable removed:

Attachments for this Section	
Attachment Name	Description
Percent Impervious Analysis-Existing.pdf	
Percent Impervious Analysis-Proposed.pdf	

7 COST & SCHEDULE

This section provides an overview of the project's funding and community support, which are used in calculations for Section E (Leverage Funds and Community Support) of SCW Project Scoring Criteria.

7.1 Cost & Schedule

Attachments for this Section	
Attachment Name	Description
2022-05-13_Total Measure W Funding Requested.pdf	
2022-05-13_Via Princessa Cost Estimate.pdf	
2022-05-13_Annual Costs.pdf	
Design Costs Breakdown.pdf	

The following tables provide details on the project's phase and annualized costs:

Phase Costs				
Phase	Description	Cost	Start Date	Completion Date
Planning	Completed task, includes feasibility work, initial planning for the project, conceptual design, coordination with agencies and sub-consultants, preparation of grant funding applications etc.	$ 1,000,000.00	02/2018	07/2022
Design	Not yet completed. Final design of the BMP and park will include developing design plans, obtaining required permits, coordinating with other agencies & sub-consultants, etc.	$ 6,554,828.00	07/2022	10/2025

Construction	CMP, diversion line, diversion structure, pretreatment (incl. materials, labor, tax, overhead/profit, contingency	$ 11,055,619.00	06/2025	06/2026
Construction	Above-ground park components (i.e. trees, new shrubs, irrigation, picnic tables, play structures, wayfinding art, bike racks, benches, etc.)	$ 8,223,332.00	06/2025	12/2026
Total Funding:		$ 26,833,779.00		

Annual Cost Breakdown	
Annual Maintenance Cost:	$ 27,000.00
Annual Operation Cost:	$ 0.00
Annual Monitoring Cost:	$ 3,000.00
Project Life Span:	50 years

The following table provide details on calculated life-cycle costs for the project (either calculated the Module, or estimated by the Project Developer)**.**

Note: these life-cycle costs are used in Section 4.3 of this output for Water Supply Benefit scoring.

Module-generated Life-Cycle Cost for Project*	$ 27,553,596.02
Module-generated Annualized Cost for Project*	$ 1,148,358.34
Use Project Developer estimate instead?	No
Custom Value specified by User:	N/A
Please provide a description of methods used to calculate Life Cycle costs, and attach supplemental information with details of the methodology, assumptions and calculations:	N/A
Supporting PDF	See attachment if applicable.

*Applies an annual discount rate as a static rate equal to 3.375%. The only costs not included in total life-cycle cost are the dismantling and replacement costs at the end of life.

7.2 Cost Share

Is additional funding being provided as a Cost Share for this project?

Yes

The following is a summary of what other sources of funding were explored and/or why funding could not be secured through these other sources:

N/A

The following table details the additional funding attained for the project:

Additional Funding				
Type of Cost Share	Sub-Phase Description	Funding Amount	Funding Status	PDF
Grant Awards	Prop A funds have been designated for the project as follows: $250k for design; $750k for construction. The agreement expires on 12/31/2023, so the City will file for an extension.	$ 1,000,000.00	Commitment Received	Prop A Backup.pdf
Grant Awards	Measure A funding is allocated to the City of Santa Clarita each year. The City then disburses those funds to selected projects. The project will be submitted for consideration to receive those funds, up to $3M.	$ 3,000,000.00	In Progress	Measure A Backup.pdf
Grant Awards	IRWM Prop 1 round 2 grants will be submitted February 2023. The Via Princessa Project has been submitted for consideration to be included in the IRWMP. The amount of funding that will be requested from Prop 1 has not yet been determined.	$ 0.00	In Progress	IRWM Prop 1 Funding Backup.pdf

Municipal Funds	$1.5M of municipal funds have already been applied to the project for development of the Safe Clean Water Feasibility Study Report. This also covered much of the work done to date to develop a preliminary design.	$ 1,500,000.00	Money Received	$1.5M Municipal Funding Backup.pdf
Municipal Funds	$4.5M of municipal funding will be requested for continued design efforts. The funding request will be submitted for the next fiscal year and has not yet been appropriated. Funding requests go before the City Council in August 2022.	$ 4,500,000.00	Commitment Received	$4.5M Municipal Funding Backup.pdf
Total Funding:		$ 10,000,000.00		

7.3 Funding Request

Total funding requested

$ 19,359,952.00

Will this project be seeking SCW Funds for O&M?

Yes

If Yes, SCW Funding Type

Full O & M Funding

If 'Partial O & M Funding', Percent of O&M requested

N/A

The following table shows the requested schedule of funding (by Year and Phase) to create a summary table for the first five years. The schedule of funding must match the Requested Funding. Funding requested beyond the 5 year should only be used for extended planning, design, and/or construction. O&M requests should be submitted as a separate funding request in 5 year increments.

Funding Requested by Year & Phase				
Year	SCW Funding Requested	Eligible Expenditure?	Phase	Efforts during Phase and Year
Year 1	$ 11,055,620.00	Yes	Construction	Construct diversion, BMP, and hydrodynamic separators.
Total Year 1	$ 11,055,620.00			
Year 2	$ 8,223,332.00	Yes	Construction	Construct above-ground park components (i.e. trees, new shrubs, irrigation, picnic tables, play structures, wayfinding art, bike racks, benches, etc.)
Total Year 2	$ 8,223,332.00			

Year 3	$ 27,000.00	Yes	O & M	Maintain the diversion structure, hydrodynamic separators, BMP, and restored Honby Channel. Frequent inspections to take place the first year, as stated in the O&M Plan, to establish a recurrence interval for future inspections and maintenance.
Total Year 3	$ 27,000.00			
Year 4	$ 27,000.00	Yes	O & M	Maintain the diversion structure, hydrodynamic separators, BMP, and restored Honby Channel. Frequent inspections to take place the first year, as stated in the O&M Plan, to establish a recurrence interval for future inspections and maintenance.
Total Year 4	$ 27,000.00			

Year 5	$ 27,000.00	Yes	O & M	Maintain the diversion structure, hydrodynamic separators, BMP, and restored Honby Channel. Frequent inspections to take place the first year, as stated in the O&M Plan, to establish a recurrence interval for future inspections and maintenance.
Total Year 5	$ 27,000.00			
Total Funding:	$ 19,359,952.00			

8 ADDITIONAL FEASIBILITY INFORMATION

This section presents additional information regarding project feasibility and technical details gathered during project design and feasibility assessment.

8.1 Environmental Documents and Permits

Environmental Documentation:

1. **Identify the lead agency for the Project per CEQA.**
2. **Identify environmental documentation (e.g. EIR, MND, ND, Exemption) that has been completed or will be prepared for the Project.**
3. **Discuss the current status and schedule for preparation and notification of environmental documentation.**
4. **State if NEPA is required and identify the lead agency under NEPA, and environmental document (e.g. EIS, FONSI, Categorical Exclusion) that has been completed or will be prepared for the Project.**

A Phase I Environmental Assessment (ESA) was performed by JHA Environmental, Inc. for Pacific Advanced Civil Engineering, Inc. (PACE) for the project site in December 2018. The objective of the ESA is to identify recognized environmental conditions (RECs), historical recognized environmental conditions (HRECs), and controlled recognized environmental conditions (CRECs), none of which are/were contained at the site. No environmental liens or other activity and use limitations (AULs) were found for the site, nor are there any listings related to underground storage tanks, stormwater or industrial waste for the site. The site is also not within 1.0 miles of a Federal Superfund property and is not likely to be impacted by other listed properties due to their regulatory status (case closed) and their down- or cross-gradient locations and their distances from the site. There were also no wetlands or wetland-type vegetation observed at the site during a field reconnaissance.

An evaluation of the Via Princessa Park and Stormwater BMP Project with respect to the current requirements set forth in the California Environmental Quality Act (CEQA), will take place in the near future. The City is in the process of developing an RFP for this task. The CEQA analysis is anticipated to be completed before construction of the site commences or before SCW funds for construction would be disbursed.

Permitting:

- **Describe all permit requirements including for the Flood Control permit. Discuss anticipated challenges associated with obtaining permits ie. time and cost. A Flood Control Permit (obtained through epicla.lacounty.gov) is required for any project affecting LACFCD right-of-way and/or facility.**
- **If a Flood Control Permit is required:**
  - **Describe how the project will affect LACFCD right-of-way and/or facility.**
  - **Provide a planning-level schedule showing the time allotted for permit review and issuance in the context of the overall project planning and delivery process**.
- **If a Use and Maintenance Agreement and/or Flood Permit already exists for this project, please provide the agreement and/or permit number(s).**

The Honby Channel culvert that the project will tie-in to is owned and maintained by the Southern California Railroad Association (SCRRA). In order to tie in to the culvert, SCRRA will perform a plan review before providing a permit for the work. The anticipated time frame for review and approval by

SCRRA is approximately 2 months from the submittal of 90-100% design plans. The details pertaining to the proposed connection will be finalized at a later phase of design and the permit request will be submitted to SCRRA shortly thereafter.

An LA County Flood Control District Flood Control Permit will be required in the northeast corner of the park, where the proposed soil cement bank protection will tie-in to the existing Cordova Estates bank protection. Communication with the District regarding this planned tie-in has been initiated and a conceptual approval for that connection has been included in the attachments to section 8.1. A Permit request will be sent to LACFCD after final design has been completed, which is anticipated in October 2024. Challenges associated with permit timing or cost are not anticipated for the project. The LACFCD permit process is anticipated to take up to 1 year, ending in 2025.

Attachments for this Section	
Attachment Name	Description
Via Princessa_LA CO SD Database_Screenshot.pdf	
Honby As-Built Plans_Title Sheet.pdf	
Site X, Santa Clarita, CA Phase I ESA - without Appendices.pdf	Appendices excluded to meet size requirement. Appendices can be provided upon request.
District Conceptual Approval City of Santa Clarita Via Princessa Park and Regional BMP Project.pdf	Letter of Conceptual Approval from LACFCD

8.2 Vector Minimization

This following provides details on vector minimization strategies.

Does the project have vector minimization plan?

Yes

Provide a description of the vector minimization plan.

The vector minimization plan developed for the Via Princessa project complies with recommended strategies laid out by the State of California Health and Human Services Agency and the California Department of Public Health, Division of Communicable Disease Control. The recommendations presented are relevant to wet systems. Wet systems are defined as any structures designed with features such as sumps, vaults, and/or basins that hold water permanently, or longer than 4 days. Because the proposed BMP system is designed to capture dry weather flows, and wet weather flows up to the 85th percentile storm event, it qualifies as a wet system.

The following strategies will be utilized for the project:
- The underground infiltration gallery will be completely below grade with the exception of manhole covers for access. The manhole covers are designed with mosquito exclusion inserts, eliminating any entry point for mosquitos.

- The manhole covers for the hydrodynamic separators will utilize non-penetrating pick points, which will prevent mosquito access there as well.

- Manhole covers will be tight fitting with no gaps or holes greater than 1/16” in size.

- The diversion at the creek, which leads to the BMP inlet pipe, could be a possible entry point for mosquitos. During detailed design, screens will be evaluated for installation at the diversion structure drop inlet opening. However, it is also important that these screens not reduce the capacity of the diversion to convey the peak 85th percentile storm flows.

- No outlet pipes are part of the system

- The underground CMP is proposed to be 8 ft. diameter, which is large enough for human entry.

- Vendors of hydrodynamic separator that were consulted for the project all carry current State Water Board certification and vector agency approval.

- The diversion pipe will be a reinforced concrete pipe (RCP) or PVC pipe, as opposed to CMP. CMP is undesirable for this system, as it traps small amounts of water in the corrugations.

- Inspection for signs of mosquito activity will be performed at the same time as inspections for debris accumulation and system performance. As part of the operations and maintenance plan, the infiltration gallery, hydrodynamic separator, and diversion structure will all be inspected after each rain event during the first two years, and at least once per quarter.

- Signage will be provided on the manhole covers for the hydrodynamic separator and the CMP infiltration gallery. Structure type is perforated CMP; ownership is by the City of Santa Clarita; contact information will be shown for the City of Santa Clarita’s Public Works Department.

Please see an attachment with proposed vector minimization plan.

Attachments for this Section	
Attachment Name	**Description**
Via Princessa Park and BMP Project Vector Minimization Plan.pdf	

Have you consulted with your local vector control district?

Yes

Please see an attached correspondences with local vector control district.

Attachments for this Section	
Attachment Name	**Description**
Correspondence with Vector Control District-1.pdf	
Correspondence with Vector Control District-2.pdf	

8.3 Alternatives Studied

Describe alternatives that were considered and evaluated as part of the Project development:

PACE performed a site selection / feasibility analysis and design for a regional infiltration BMP facility at Newhall Park on behalf of the City of Santa Clarita. Several potential regional infiltration BMP sites were identified within the Upper Santa Clara River Watershed Management Group (USCRWMG) Enhanced Watershed Management Plan (EWMP), but a more in-depth analysis was required to determine the viability and infiltration effectiveness of each location. In order to help the City reach their short-term infiltration goals, PACE performed an investigation of the potential sites, which included site evaluations for suitability, infiltration optimization, development of optimum layouts, and construction cost estimates. Factors such as infiltration rates, proximity of the groundwater table, existing utility conflicts, 85th percentile watershed runoff volume, and feasibility of diverting from the adjacent storm drain system heavily influenced the investigation process. A rigorous alternatives analysis was then performed to carefully evaluate the merits of each site and PACE made recommendations to the City. The City selected the Via Princessa park site (formerly known as 'Site X') for design, due to its strategic location over the Santa Clara River Valley East Groundwater Subbasin, the sizeable watershed draining to it, its being located in a park-poor area of the City, and due to the fact that no existing facilities/infrastructure exist on the site. There were other sites deemed suitable by the feasibility analysis; however, they did not possess as many benefits for the City as the Via Princessa park site.

8.4 Effectiveness

Describe the effectiveness of similar types of projects already constructed if applicable:

The County of Los Angeles District of Public Works has completed and proposed several similar projects which demonstrate the effectiveness of storm water quality management projects similar to the Via Princessa BMP and Park Project. One similar project which demonstrates effectiveness is the proposed Franklin D. Roosevelt Park Regional Stormwater Capture Project which is a County of Los Angeles Department of Public Works (LACDPW) project that proposes several improvements to Roosevelt Park to increase water conservation, improve water quality, and provide additional recreation, education, and outreach benefits to Park visitors. The Park encompasses approximately 24 acres and lies adjacent to the Glen Avenue Drainage System that discharges into Compton Creek, which is a tributary of the Los Angeles River, both of which are water quality impaired. LACDPW is proposing to divert dry- and wet-weather flows from the Glen Avenue Drainage System and to provide pre-treatment of water for infiltration to the groundwater basin. The proposed project would achieve multiple benefits, including water quality improvements, water conservation, Park facility upgrades, and education and outreach signage. This project is very similar to the Via Princessa BMP & Park Project because it would also infiltrate stormwater infiltration underneath a park, in addition to other onsite diversion and infiltration measures.

The Canyon Country Community Center, located in the City of Santa Clarita, is another similar project that has already been implemented. Located not far from the Via Princessa site, on the north side of the Santa Clara River, the Canyon Country Park captures 7.5 ac-ft of runoff (85th percentile) from a 77 acre watershed in a subsurface infiltration chamber. The water quality/water supply benefits from this existing project will be compounded with the addition of the proposed Via Princessa Park.

8.5 Legal Requirements and Obligations

Describe any legal requirements or obligations that may arise as a result of constructing the Project and how these requirements will be satisfied, including any legal requirements or

obligations that may be in conflict with the SCW Regional Program Transfer Agreement:

No legal requirements/obligations anticipated due to constructing the project. No legal requirements or obligations in conflict with the SCW Regional Program Transfer Agreement Template.

8.6 Technical Reports

Please upload additional technical reports related to this project not provided above.

8.7 Other

Provide any additional information related to the Project as necessary:

Attachments in this section are referenced in prior sections, but did not have a more appropriate place to attach them.

Attachments for this Section	
Attachment Name	**Description**
SCV GW Basin Map.pdf	Santa Clarita Groundwater Basin Map with Project Location Overlay. Cited in section 4.1
Via Princessa Disadvantaged Communities.pdf	Disadvantaged community boundaries at/near Via Princessa Project Site. Cited in Section 1.3.
CA Fact Finder Report.pdf	Fact Finder Report generated for Via Princessa Project. Cited in Section 1.3.
CalEnviro Score.pdf	CalEnviro Score generated for Via Princessa Project. Cited in Section 1.3.
LA Co Park Needs Assessment.pdf	LA County park needs assessment for Santa Clarita. Cited in Section 1.3.
2008 city open space and master plan update - excerpt.pdf	2008 City of Santa Clarita Open Space and Master Plan Update. Cited in Section 5.1.
FEMA FIRM Panel.pdf	FEMA Flood Insurance Rate Map for areas in proximity to Via Princessa Project. Cited in Section 1.4.
Honby Photos - Nov 2021.pdf	Photos of Honby Channel during November 2021 site visit. Cited in section 4.3.
Honby Photos - Jan 2022.pdf	Photos of Honby Channel from the January 2022 field visit. Cited in Section 4.3.
Honby Photos - Feb 2022.pdf	Photos of Honby Channel from the February 2022 field visit. Cited in Section 4.3.
Honby Photos - Mar 2022.pdf	Photos of Honby Channel from the March 2022 field visit. Cited in Section 4.3.
MS4 Permit Attachment M - SCR TMDLs.pdf	MS4 permit applicable to the Santa Clara River, which lists TMDLs for the project reach. Cited in Section 3.1.
SCVWA 2020 UWMP - Excerpt.pdf	Santa Clarita Valley Water Agency 2020 Urban Water Management Plan. Discusses groundwater models; known concerns. Cited in Section 4.1.

SCVGSA 2022 GSP - Excerpt.pdf	Santa Clara River Valley East Groundwater Subbasin Groundwater Sustainability Plan. Lists known groundwater issues/concerns. Cited in Section 4.1.

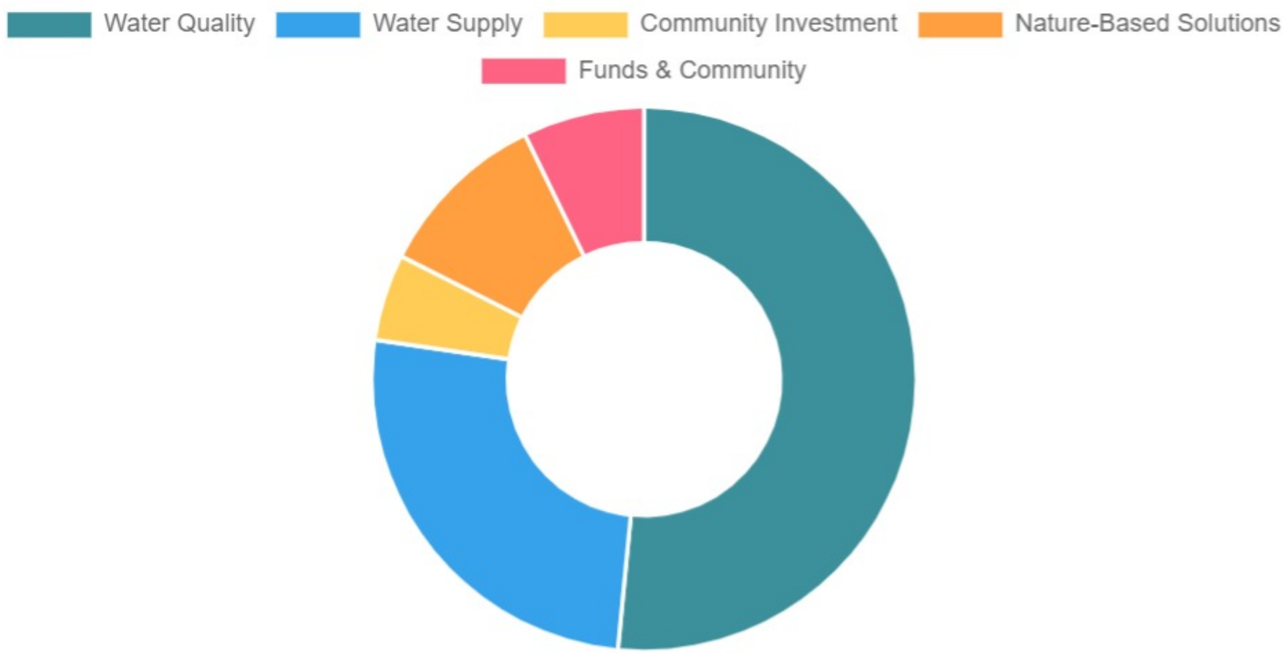
9 SCORING

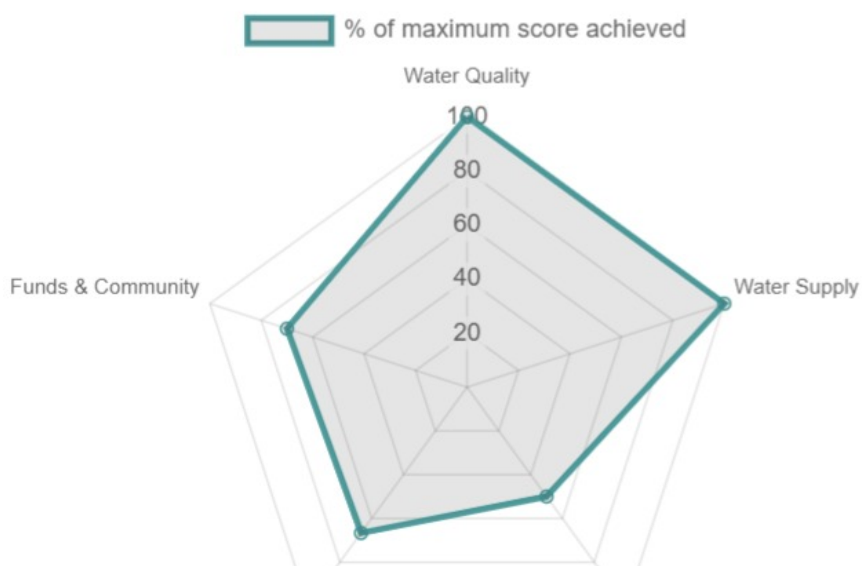
This section summarizes scoring calculations generated by the Module. All Regional Program Projects must meet the Threshold Score of 60 points or more using the following Project Scoring Criteria to be eligible for consideration.

Note: all scoring estimates are considered preliminary and subject to review and revision by the Scoring Committee.

Preliminary Estimated Project Score:
97 points

The following graphics summarize the project scoring. The first graphic shows the components of the project score, based on the different scoring sections. The second graphic shows the percent of maximum score achieved by the project within each scoring section.


Water Quality
Water Supply
Community Investment
Nature-Based Solutions
Funds & Community


% of maximum score achieved
Water Quality
Water Supply
Funds & Community
100
80
60
40
20

The following table details the scoring calculated for the project, along with the scoring thresholds from the SCW Project Scoring Criteria:

Scoring Section	Project Score	Max Score	Scoring Criteria Thresholds
Water Quality Wet + Dry Weather **Part 1**	20	20	Cost Effectiveness = (24-hour BMP Capacity) / (Construction Cost in $Millions) • <0.4 = 0 points • 0.4-0.6 = 7 points • 0.6-0.8) = 11 points • 0.8-1.0 = 14 points • >1.0 = 20 points
Water Quality Wet + Dry Weather **Part 2**	30	30	Primary Pollutant Reduction: • >50% = 15 points • >80% = 20 points Secondary Pollutant Reduction: • >50% = 5 points • >80% = 10 points
Water Quality Dry Weather Only **Part 1**	N/A	20	For dry weather BMPs only, Projects must be designed to capture, infiltrate, or divert 100% (unless infeasible or prohibited for habitat, etc.) of all tributary dry weather flows.
Water Quality Dry Weather Only **Part 2**	N/A	20	For Dry Weather BMPs Only. Tributary Size of the Dry Weather BMP: • <200 Acres = 10 points • >200 Acres = 20 points
Water Supply Part 1	13	13	• >$2500/ac-ft = 0 points • $2,000–2,500/ac-ft = 3 points • $1500-2,000/ac-ft = 6 points • $1000–1500/ac-ft = 10 points • <$1000/ac-ft = 13 points
Water Supply Part 2	12	12	• <25 ac-ft/year = 0 points • 25 - 100 ac-ft/year = 2 points • 100 - 200 ac-ft/year = 5 points • 200 - 300 ac-ft/year = 9 points • >300 ac-ft/year = 12 points
Community Investment	5	10	• One Benefit = 2 points • Three Benefits = 5 points • Six Benefits = 10 points

Nature Based Solutions	10	15	• Implements natural processes or mimics natural processes to slow, detain, capture, and absorb/infiltrate water in a manner that protects, enhances and/or restores habitat, green space and/or usable open space = 5 points • Utilizes natural materials such as soils and vegetation with a preference for native vegetation = 5 points • Removes Impermeable Area from Project (1 point per 20% paved area removed) = 5 points
Leveraging Funds Part 1	3	6	• >25% Funding Matched = 3 points • >50% Funding Matched = 6 points
Leveraging Funds Part 2	4	4	The Project demonstrates strong local, community-based support and/or has been developed as part of a partnership with local NGOs/CBOs.
Total	**97**	110 / 100	

10 ATTACHMENTS

Attachments are bundled and organized in the following pages, with cover pages between each subsection.

Please note – at a minimum, a feasibility study must attach the following:

- A Location Map
- A Schematic with Proposed Footprint and Key Components
- A Map of the Capture Area (Tributary Map)
- Technical Reports (e.g. soil report, hydrology report, hydraulic study, utility search, survey, PEIR, EIR, monitoring data, etc.)

ATTACHMENTS FOR SECTION 1.4:

PROJECT SUMMARY

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Via Princessa BMP & Park Project

Infrastructure Program Executive Summary

Upper Santa Clara River, City of Santa Clarita, FY23-24

SAFE CLEAN WATER PROGRAM

Project Background

The proposed project, located in the City of Santa Clarita, will include an underground infiltration BMP system and a new park.

Project Objectives: Reduce pollutants reaching the Santa Clara River, improve water supply in the Santa Clara River Valley East Groundwater Subbasin, sustain nearby production wells, and to meet the park/recreational needs of the surrounding community.

Project Status: Initial planning & design completed. Final design, construction, and O&M not yet completed. Funding being requested for construction and O&M.

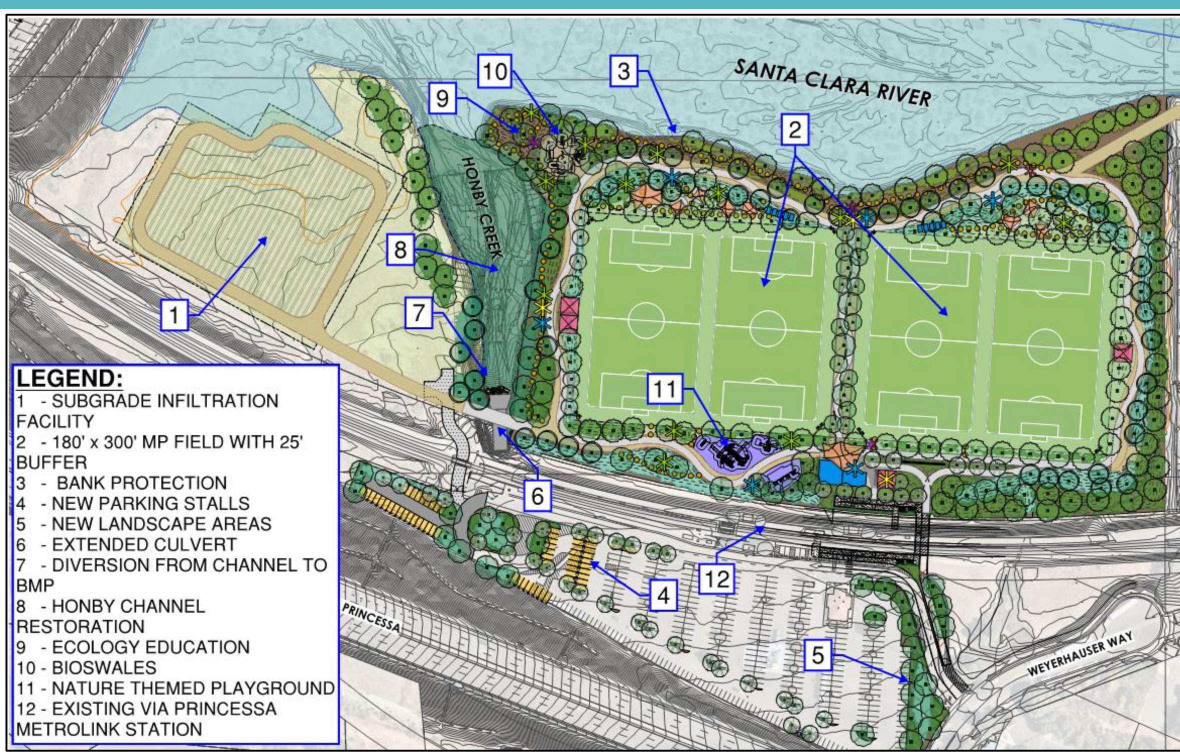
Total Funding Requested: $ 19,359,953:

- $19.3M for construction
- $81k for operations, maintenance, & monitoring

Project Overview

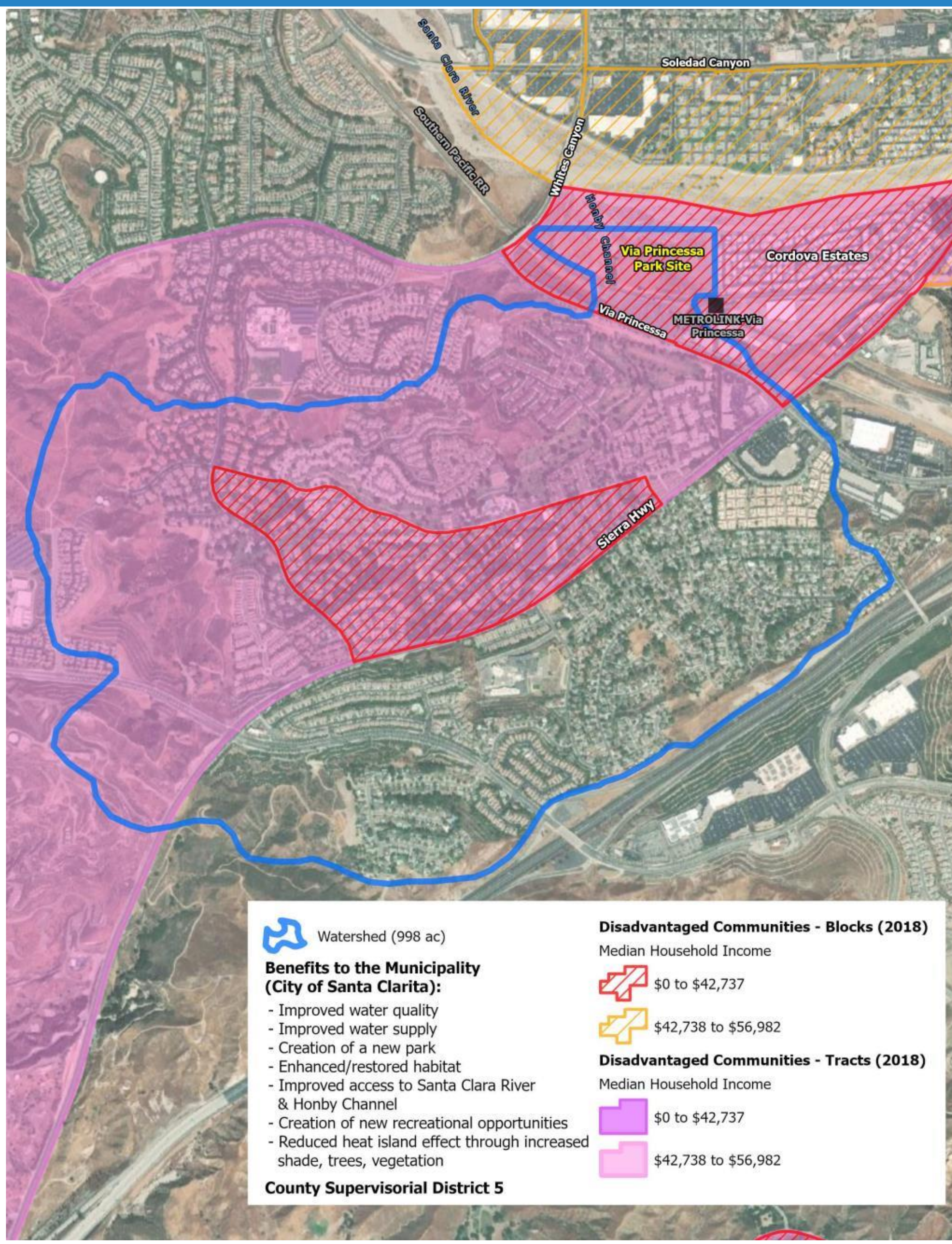
- The project site is ideally located over the East Subbasin of the Santa Clarita Valley Groundwater Basin for recharge, in support of existing infrastructure. The site is also located within and near several DAC block groups and is ideally situated to benefit them. This location has also been recognized by several studies as being a park-poor area.
- The project is included in the Upper Santa Clara River Enhanced Watershed Management Program (EWMP) and Upper Santa Clara River Integrated Watershed Management Plan (IRWMP).
- The project will benefit the community through water quality & supply improvements, increased park space, enhanced/restored habitat, improved access to the Santa Clara River and Honby Channel, creation of new recreational opportunities, and reducing heat island effect through increased shade, planting of trees, and other vegetation.
- Project will benefit the DAC by providing the aforementioned benefits within a ½ mile radius of 351 community members who are living in poverty and 71 households who do not have access to a car.

Project Details



- BMP type: wet / subterranean, perforated, corrugated metal pipe (CMP) gallery.
- Description of current site conditions: The 26-acre site is currently undeveloped and vacant.
- Land ownership/right of way: The site was purchased from the County by the City in 2016. The area between the park and parking lot is owned by SCRRA. Ownership of the Honby Channel culvert is held by SCRRA. LACFCD owns/maintains the bank protection to the north of Cordova Estates (which lies immediately to the east of the park site).
- Completed studies/analysis: Geotechnical investigation, topographic and utility survey, as-built research, hydrology analysis, Phase I study, and groundwater model.

Project Location



SAFE CLEAN WATER PROGRAM

Preliminary Score

Benefit	Score	Description
Water Quality	50	• Primary mechanisms that achieve Water Quality and Water Supply Benefits claimed: ○ 997.8 ac tributary area ○ 30.1 ac-ft infiltration capacity (in 41.5 hrs) ○ 89.1% bacteria removed ○ 96.3% Copper removed ○ Wet Facility ○ 1,652 ac-ft/year ○ 1.5 (acre-ft capacity / $-Million) ○ $504/ac-ft
Water Supply	25	
Community Investment	5	• Description of community investment benefits provided: ○ Improve water quality ○ Improve water supply ○ Create park space ○ Improve access to waterways ○ Create new recreational opportunities ○ Reduce heat island/increase shade ○ Increase shade/trees/vegetation
Nature Based Solutions	10	• Description of how the project implements nature-based solutions ○ Use of infiltration BMP/soil to infiltrate and treat water ○ Use of native vegetation and bio-swales to naturally treat runoff ○ Increased vegetation & trees to enhance soil & provide shade ○ Enhance/restore vegetation and habitat in Honby Channel
Leveraged Funds	3	• Cost share funding = $7,300,000 • Percent Funded Cost Share = 26.74%
Community Support	4	• Meeting materials from community engagement meetings (June Cordova Estates meeting and July community-wide meeting) • Letters of support from NGO's • Letters of support from individual community members • Planned outreach: TBD
TOTAL	**97**	

Project Cost & Schedule

Phase	Description	Cost	Completion Date
Construction	Above-ground park components (i.e. trees, shrubs, irrigation, picnic tables, play structures, wayfinding art, bike racks, benches, etc.)	$8,223,332.00	08/2024
Construction	CMP, diversion line, diversion structure, pretreatment (incl. materials, labor, tax, overhead/profit, contingency)	$11,055,619.00	08/2024
TOTAL			

- Annual maintenance costs = $27,000
- Annual monitoring costs = $3,000
- Project life span = 50 yrs

SAFE CLEAN WATER PROGRAM

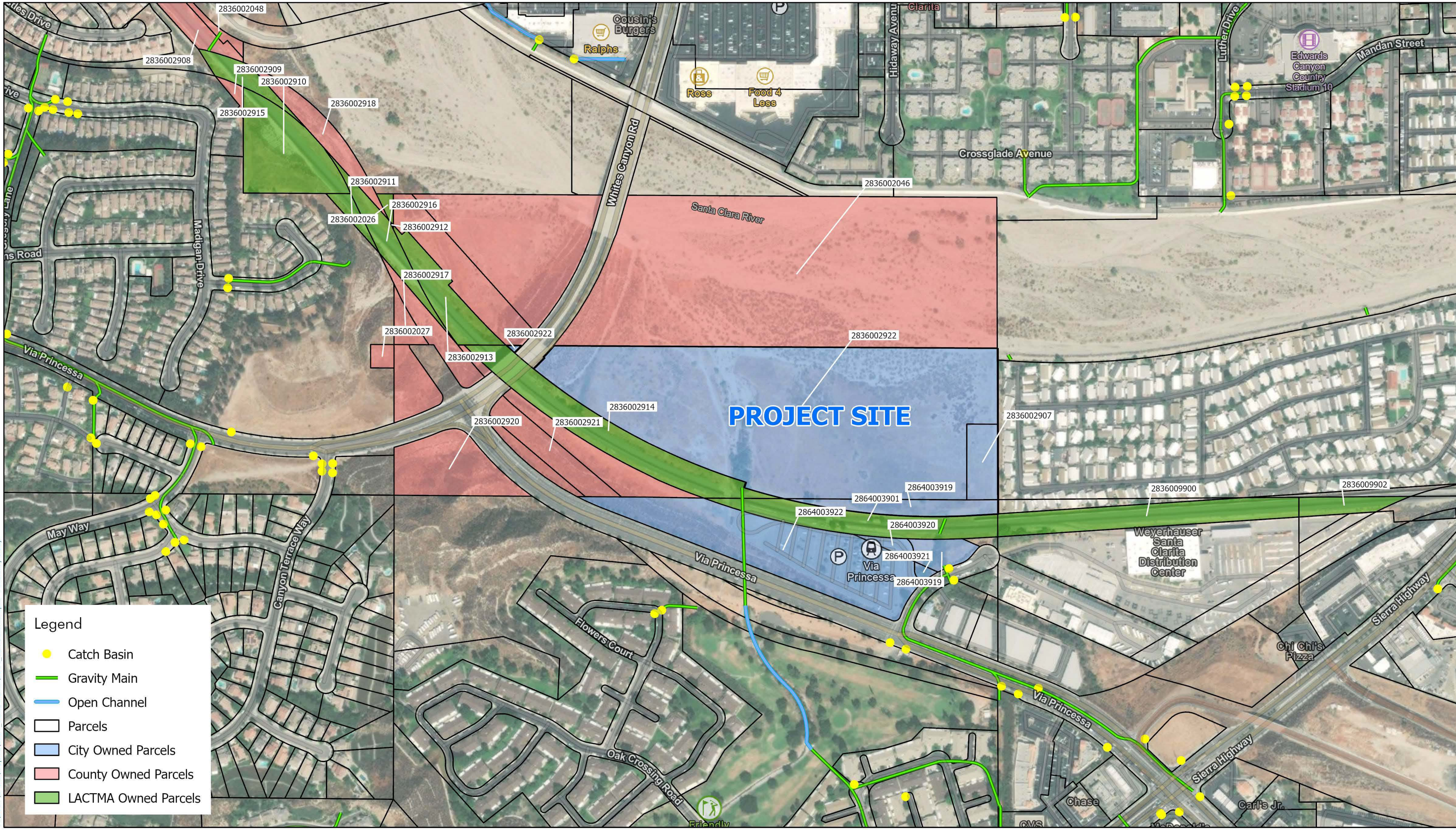
Funding Request			
Year	SCW Funding Request	Phase	Efforts during Phase and Year
1	$11,055,620.00	Construction	Construct diversion, BMP, and hydrodynamic separators.
2	$8,223,332.00	Construction	Construct above-ground park components (i.e. trees, new shrubs, irrigation, picnic tables, play structures, wayfinding art, bike racks, benches, etc.)
3	$27,000.00	O&M	Maintain the diversion structure, hydrodynamic separators, BMP, and restored Honby Channel. Frequent inspections to take place the first year, as stated in the O&M Plan, to establish a recurrence interval for future inspections and maintenance.
4	$27,000.00	O&M	Maintain the diversion structure, hydrodynamic separators, BMP, and restored Honby Channel. Frequent inspections to take place the first year, as stated in the O&M Plan, to establish a recurrence interval for future inspections and maintenance.
5	$27,000.00	O&M	Maintain the diversion structure, hydrodynamic separators, BMP, and restored Honby Channel. Frequent inspections to take place the first year, as stated in the O&M Plan, to establish a recurrence interval for future inspections and maintenance.
TOTAL	**$19,359,952.00**		

ATTACHMENTS FOR SECTION 1.2:

OVERVIEW

ATTACHMENTS FOR SECTION 1.3:

PROJECT LOCATION



P:\B351\6-GIS\Projects\B351_SantaClarita\B351_SantaClarita.aprx - Feasibility Study

VIA PRINCESSA PARK AND BMP PROJECT

OWNERSHIP & ROW EXHIBIT

PACE Advanced Water Engineering

0 200 400 800 Feet

N

Date: 6/9/2022

Job Number: B351

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ATTACHMENTS FOR SECTION 1.4:

PROJECT DESCRIPTION

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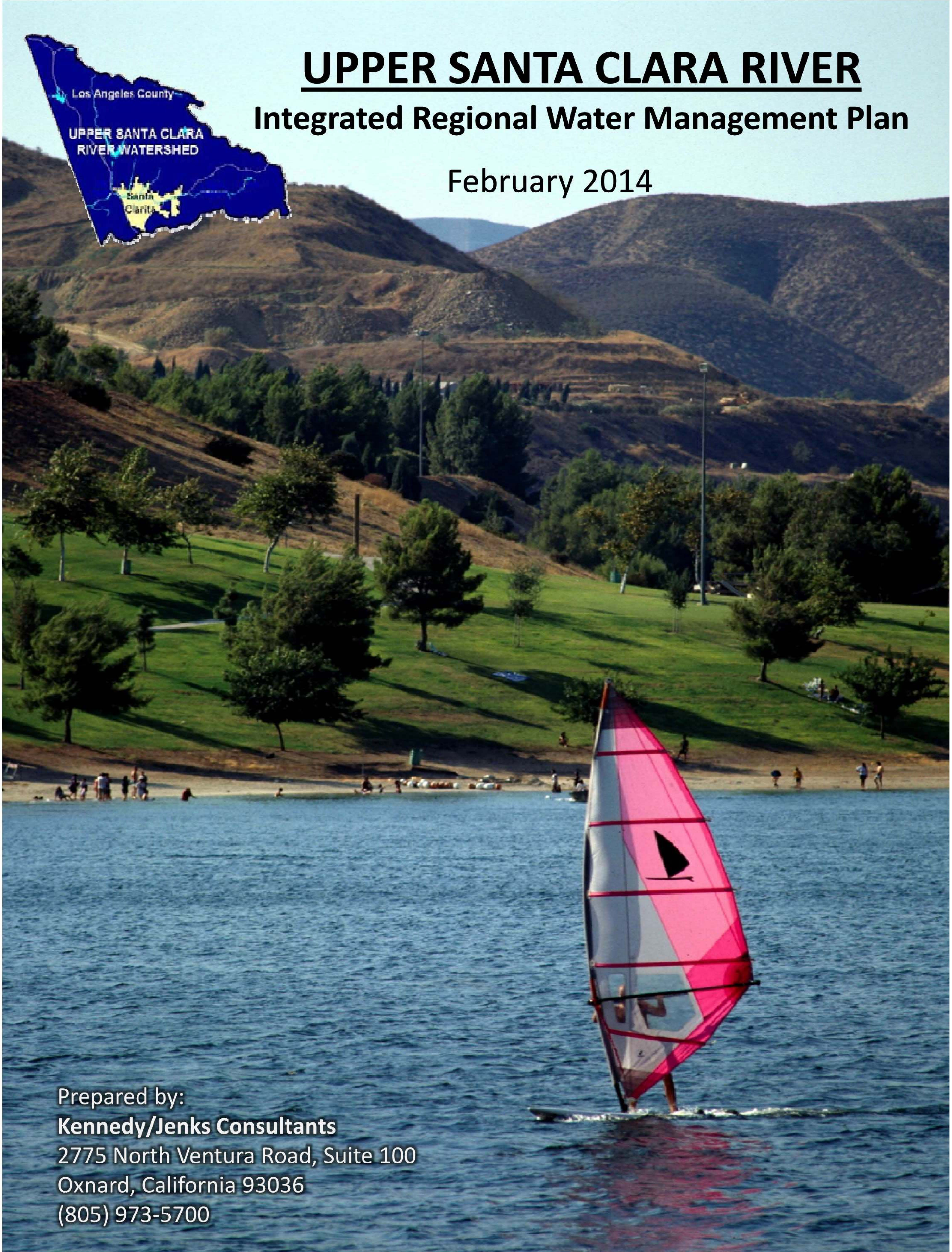
UPPER SANTA CLARA RIVER

Integrated Regional Water Management Plan

February 2014



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Oxnard, California 93036
(805) 973-5700

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Section 1: Introduction

The Upper Santa Clara River Integrated Regional Water Management Plan (IRWMP) was completed and adopted by the Regional Water Management Group (RWMG) in 2008. This Plan updates and expands upon the original Upper Santa Clara River IRWMP, documents progress towards meeting IRWMP objectives, and identifies ongoing regional needs and issues.

This section provides an introduction to the Region covered by this IRWMP, the Stakeholders participating in development of this IRWMP, and the Stakeholder process utilized to develop this IRWMP.

1.1 Introduction to the Region

The Santa Clara River Watershed (Watershed) consists of approximately 1,634 square miles and contains the upper reaches of the Santa Clara River. The River, which is the largest natural river remaining in Southern California, travels through two counties, Los Angeles and Ventura.

The Region included in this IRWMP is located within the Upper portion of the Watershed (see Figures 1.1-1 and 1.1-2). The Region represents an area of approximately 654 square miles. The Upper Basin of the Santa Clara River, as defined for the purposes of this IRWMP, is bounded by the San Gabriel Mountains to the south and southeast, the Santa Susana Mountains to the southwest, the Transverse Ranges to the northeast, the Sierra Pelona Mountains to the east, and the Ventura County Line to the west. The Region encompasses the City of Santa Clarita, the unincorporated communities of Castaic, Stevenson Ranch, West Ranch, Agua Dulce, and Acton, as well as portions of the Angeles National Forest. The Upper Santa Clara River Watershed is a logical region for integrated regional water management due to its history of cooperative water management, the topography and geography of the Region and the similarity of water issues facing agencies in the Region. The Region is a contiguous geographic area and has been defined in a manner to maximize opportunities for integration of water management activities.

Upper Santa Clara River

Because the Santa Clara River travels through two counties, Los Angeles and Ventura, ongoing coordination of efforts is needed in order to address issues of mutual concern and benefit, such as water quality improvement. Therefore, representatives of the Region work with the stakeholders and agencies in the lower reaches of the Watershed, which lie in Ventura County, to include them in the IRWMP planning process and to coordinate efforts to protect the Watershed.

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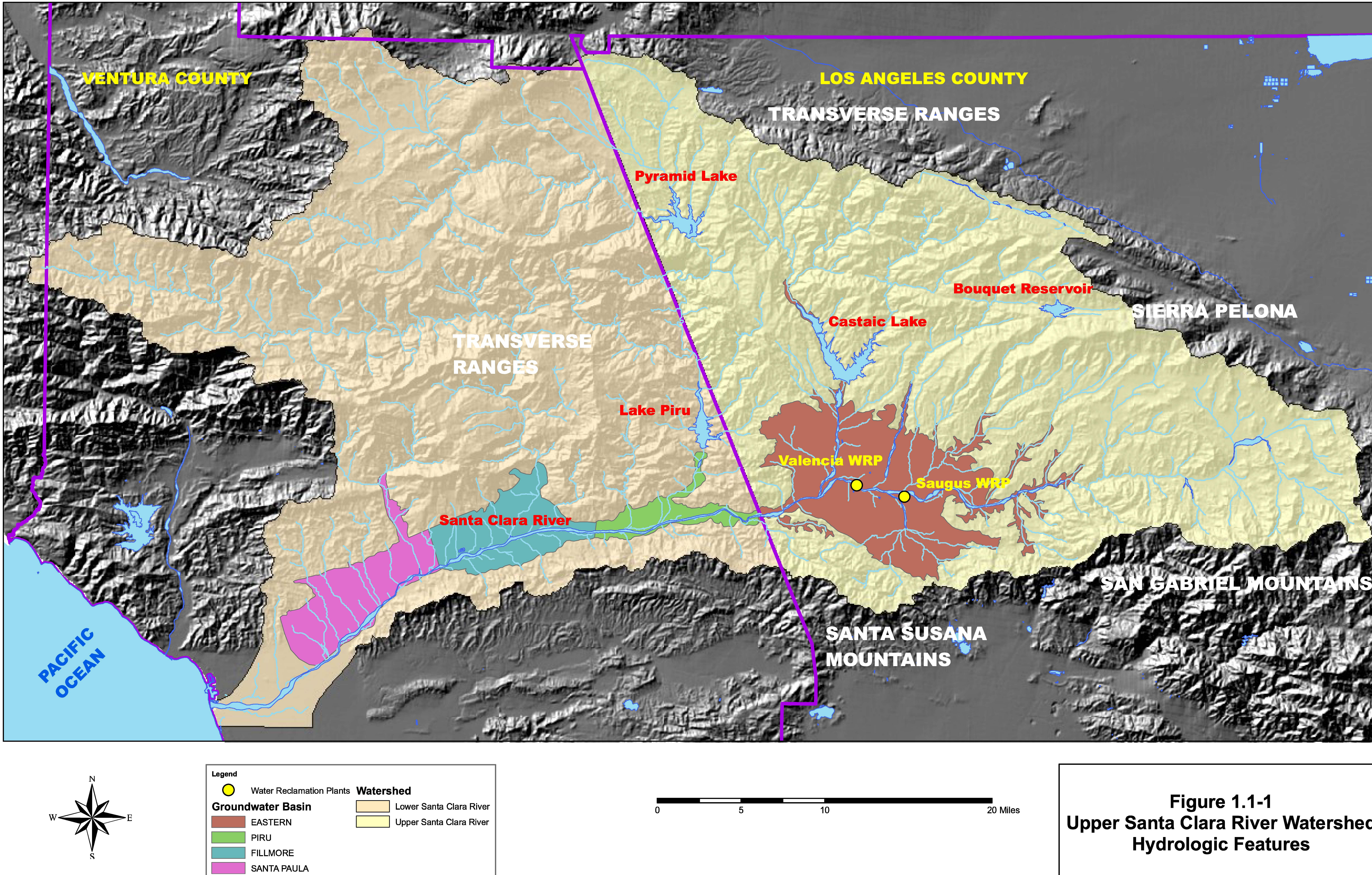

Figure 1.1-1
Upper Santa Clara River Watershed
Hydrologic Features

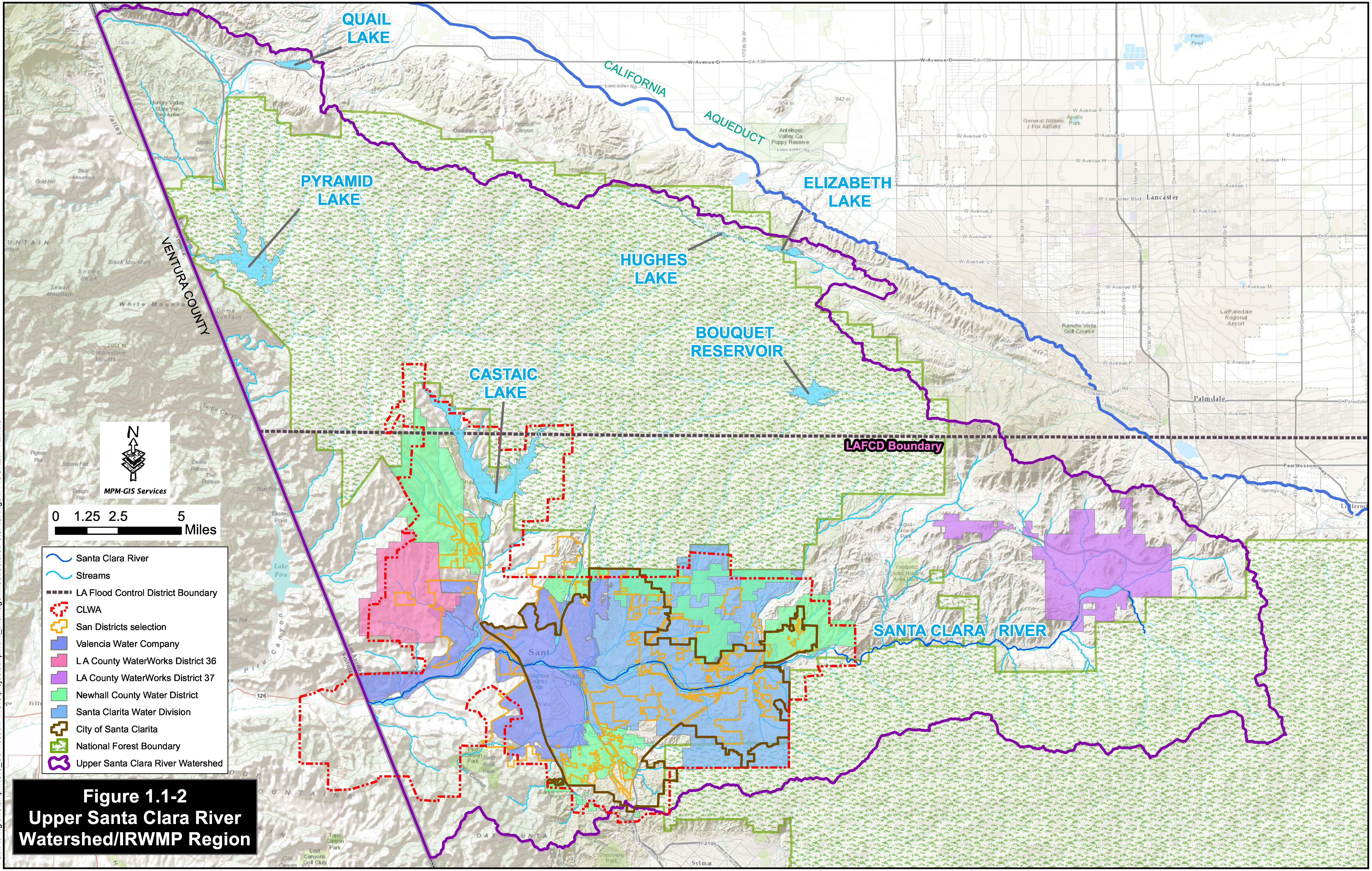

Figure 1.1-2
Upper Santa Clara River Watershed/IRWMP Region

Avenue. Phase 2C will result in the use of up to 910 AFY of recycled water from the Valencia WRP.

Ultimately, the CLWA recycled water system, along with the recycled water system proposed as part of the Newhall Ranch Development, will recycle approximately 22,800 AFY for non-potable uses.

Valencia Water Reclamation Plant

3.1.4.1 New Wastewater Treatment Facilities

A third Valley reclamation plant, the Newhall Ranch WRP, is proposed as part of the Newhall Ranch project. This proposed facility would be located near the western edge of the development project along the south side of State Route 126. The plant would be constructed in stages, with an ultimate capacity of 6.8 MGD (7,616 AFY) as stated in the RWQCB's Order R4-2007-0046. According to the Newhall Ranch Resource Management and Development Plan/Spineflower Conservation Plan EIS/EIR of April 2009, approximately 5,400 AFY of the tertiary treated water from this plant is projected to be used by the Newhall Ranch Project. The WRP will serve the Newhall Ranch Specific Plan and a new County Sanitation District has been created to operate and maintain the Newhall Ranch WRP.

3.2 Water Quality

The Region's water is an important resource and its quality is of vital importance. The quality of water affects the ability to use it, affects the cost of providing treated drinking water, affects habitat conditions, and can impair or enhance recreation.

3.2.1 Surface Water Quality

This section discusses water quality as it pertains to pollution and the natural environment.

3.2.1.1 Basin Plan

The Los Angeles RWQCB Basin Plan (1994) includes water quality objectives for the entire Santa Clara River Watershed. These objectives were established to protect the various beneficial uses for that particular water body or reach. The water bodies of the Upper Santa Clara River watershed, which include streams, natural lakes and reservoirs, span a wide variety of existing, potential and/or intermittent beneficial uses. The following is a list of the beneficial uses identified in the Upper Santa Clara River Region:

- Municipal and Domestic Supply
- Industrial Service Supply
- Industrial Process Supply
- Agricultural Supply
- Groundwater Recharge

- Freshwater Replenishment
- Hydropower Generation
- Water Contact and Non-contact Water Recreation
- Warm and Cold Freshwater Habitat
- Wildlife Habitat
- Rare, Threatened, and Endangered Species
- Spawning, Reproduction, and/or Early Development

All of the water bodies in the Region support the designated beneficial uses (either existing or intermittent) of municipal and domestic supply, agricultural supply, groundwater recharge, water contact recreation, non-contact water recreation, wildlife habitat, and warm freshwater habitat. In addition, many water bodies (such as Bouquet, San Francisquito, and Soledad Canyons) support the designated beneficial uses (either existing or intermittent) of rare, threatened or endangered species; wetland habitat; and/or spawning, reproduction, and/or early development. Regional reservoirs that support hydropower generation include Elderberry Forebay, Castaic Lake, Dry Canyon Reservoir, Bouquet Reservoir, and Pyramid Lake. Local surface waters are not a direct source of drinking water supply in the Region, but they are a continual source of recharge to groundwater which is used to meet municipal water demands.

Table 3.2-1 shows Basin Plan water quality objectives of selected conventional pollutants meant to protect the beneficial uses in the Upper Santa Clara River watershed. The Basin Plan also outlines many narrative water quality objectives as well as various statewide plans and policies which contain applicable water quality objectives, some of which have been found to be causing impairment in the Upper Santa Clara River.

In addition to the aforementioned water quality objectives, since the 1994 version of the Basin Plan was adopted, several key plans and policies which affect California were developed containing water quality standards. U.S. EPA adopted the National Toxics Rule (NTR) on December 22, 1992, and later amended it on May 4, 1995 and November 9, 1999. About 40 criteria in the NTR were applicable in California. On May 18, 2000, U.S. EPA adopted the California Toxics Rule (CTR). The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on February 13, 2001. These rules contain water quality standards for priority pollutants. The State Water Board adopted the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Policy or SIP) in March 2000 and amended it in February 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control.

TABLE 3.2-1
WATER QUALITY OBJECTIVES FOR WATERS IN THE UPPER SANTA CLARA RIVER WATERSHED

	TDS (mg/L)	Chloride (mg/L)[(a)]	Sulfate (mg/L)	Nitrogen (mg/L)	SAR (mg/L)[(b)]	Boron (mg/L)
Inland Surface Waters						
Above Lang gaging station (Reach 8)	500	50	100	5	5	0.5
Between Lang gaging station and Bouquest Canyon Road Bridge (Reach 7)	800	100	150	5	5	1.0
Between Bouquet Canyon Road Bridge and West Pier Highway 99 (Reach 6)	1000	100	300	10	5	1.5
Between West Pier Highway 99 and Blue Cut gaging station (Reach 5)	1000	100	400	5	10	1.5
Groundwater Basins						
Acton Valley	550	100	150	10;45;10;1[(c)]	NA	1.0
Sierra Pelona Valley (Agua Dulce)	600	100	100	10;45;10;1[(c)]	NA	0.5
Upper Mint Canyon	700	100	150	10;45;10;1[(c)]	NA	0.5
Upper Bouquet Canyon	400	30	50	10;45;10;1[(c)]	NA	0.5
Green Valley	400	25	50	10;45;10;1[(c)]	NA	-
Lake Elizabeth-Lake Hughes area	500	50	100	10;45;10;1[(c)]	NA	0.5
Santa Clara-Mint Canyon	800	150	150	10;45;10;1[(c)]	NA	1.0
South Fork	700	100	200	10;45;10;1[(c)]	NA	0.5
Placerita Canyon	700	100	150	10;45;10;1[(c)]	NA	0.5
Santa Clara-Bouquet and San Francisquito Canyons	700	100	250	10;45;10;1[(c)]	NA	1.0
Castaic Valley	1000	150	350	10;45;10;1[(c)]	NA	1.0
Saugus Formation	-	-	-		NA	-

Notes:
(a) The RWQCB has adopted revised Site-Specific Objectives (SSOs) for chloride. See RWQCB Order No. R4-2008-012.
(b) SAR = Sodium adsorption ratio.
(c) 10 mg/L nitrogen (as nitrate + nitrite); 45 mg/L nitrate (as NO_3); 10 mg/L nitrate-nitrogen; 1 mg/L nitrite-nitrogen.

3.2.1.2 Water Quality Management Tools

The Safe Drinking Water Act (SDWA) was originally passed by Congress in 1974 to protect public health by regulating the nation's public drinking water supply. SDWA applies to every public water system in the United States. SDWA authorizes the US EPA to set national health-based standards for drinking water to protect against both naturally-occurring and man-made contaminants that may be found in drinking water. Originally, SDWA focused primarily on treatment as the means of providing safe drinking water at the tap. Amendments in 1996 greatly enhanced the existing law by recognizing source water protection, operator training, funding for water system improvements, and public information as important components of safe drinking water. Under the SDWA, technical and financial aid is available for certain source water protection activities.

The Federal Clean Water Act (CWA) contains two strategies for managing water quality including, (1) a technology-based approach that envisions requirements to maintain a minimum level of pollutant management using the best available technology; and (2) a water quality-based approach that relies on evaluating the condition of surface waters and setting limitations on the amount of pollution that the water can be exposed to without adversely affecting the beneficial uses of those waters. Section 303(d) of the CWA bridges these two (2) strategies. Section 303(d) requires that the States make a list of waters that are not attaining standards after the technology-based limits are put into place. For waters on this list (and where the US EPA administrator deems they are appropriate), the States are required to develop a numeric Total Maximum Daily Load (TMDL). A TMDL must account for all sources of the pollutants that caused the water to be listed. Federal regulations require that the TMDL, at a minimum, account for contributions from point sources (Federally permitted discharges) and contributions from nonpoint sources.

A TMDL is a number that represents the assimilative capacity of receiving water to absorb a pollutant. A TMDL is the sum of the individual wasteload allocations for point sources, load allocations for nonpoint sources, an allotment for natural background loading, as well as a margin of safety and additional accounting for seasonal variation. TMDLs can be expressed in terms of mass per time (the traditional approach) or in other ways such as toxicity or a percentage reduction or other appropriate measure relating to a state water quality objective. A TMDL is implemented by reallocating the total allowable pollution among the different pollutant sources (through the permitting process or other regulatory means) to ensure that the water quality objectives are achieved.

3.2.1.3 Section 303(D) List of Water Quality Limited Segments

The 2010 Section 303(d) Impaired Waterbodies List for the Upper Santa Clara River Watershed was approved by the SWRCB on September 21, 2009 and was approved by the US EPA on October 11, 2011. There are a number of constituents that are on the 2010 303(d) list for Reaches 5, 6 and 7 of the Santa Clara River, and for Lake Hughes, Lake Elizabeth and Munz Lake, which are also within the Region. Figure 2.1-1 shows the various reaches of the Santa Clara River. Table 3.2-2 provides a summary of the current listings of impaired water bodies of the Upper Santa Clara River Watershed.

3.2.1.4 TMDLs

The Santa Clara River currently has three adopted TMDLs due to non-attainment of water quality objectives, one pertaining to chloride, another pertaining to nitrogen compounds, and a third pertaining to bacteria. Another TMDL is in place for three lakes within the Region that are impaired with trash.

TABLE 3.2-2
2010 303(D) LIST OF IMPAIRED WATER BODIES –
UPPER SANTA CLARA RIVER WATERSHED

Name	Pollutant/ Stressor	Potential Sources	Typical Data Range	Basin Plan Objective	Est. Size Affected (acres)	Proposed/ Approved TMDL Completion
Elizabeth Lake	Eutrophication	Nonpoint	NA	NA	123	2019
	Organic Enrichment/ Low Dissolved Oxygen	Nonpoint	0.8 – 11.0 mg/L	Annual mean > 7.0 mg/L; No sample < 5.0 mg/L	123	2019
	pH	Nonpoint	7.3 - 9.6	6.5 – 8.5	123	2019
	Trash	Nonpoint	NA	NA	123	2008
Lake Hughes	Algae	Nonpoint	NA	NA	21	2019
	Eutrophication	Nonpoint	NA	NA	21	2019
	Fish Kills	Nonpoint	NA	NA	21	2019
	Odor	Nonpoint	NA	NA	21	2019
	Trash	Nonpoint	NA	NA	21	2008
Munz Lake	Eutrophication	Nonpoint	NA	NA	7	2019
	Trash	Nonpoint	NA	NA	7	2008
Santa Clara River, Reach 5 (Blue Cut to West Pier Hwy 99)	Chloride	Nonpoint/ Point	10 – 138 mg/L	80 – 100 mg/L	9	2005
	Coliform	Nonpoint/ Point	20 -24,000 MPN[(a)]/ 100 mL	30-day log mean < 200 MPN[(a)]/100 mL; no more than 10% of samples > 400 MPN[(a)]/100 mL	9	2019
	Iron	Nonpoint	NA	NA	9	2021
Santa Clara River, Reach 6 (West Pier Hwy 99 to Bouquet Cyn Rd)	Chloride	Nonpoint/ Point	10 – 138 mg/L	80 – 100 mg/L	5	2005
	Chlorpyrifos	Unknown	NA	NA	5	2019
	Coliform	Nonpoint/ Point	20 -24,000 MPN[(a)]/100 mL	30-day log mean < 200 MPN[(a)]/100 mL; no more than 10 % of samples > 400 MPN[(a)]/100mL	5	2019
	Copper	Nonpoint	NA	NA	5	2021
	Diazinon	Unknown	NA	NA	5	2019
	Iron	Unknown	NA	NA	5	2021
	Toxicity	Unknown	NA	NA	5	2019
Santa Clara River, Reach 7 (Bouquet Cyn Rd to Lang Gaging)	Coliform	Nonpoint	NA	NA	21	2019

Source: SWRCB 2010.
Note: (a) MPN = Most Probable Number.

3.2.1.4.1 Nitrogen Compounds

The nitrogen compounds TMDL for Reaches 5 and 6 (previously Reaches 7 and 8) of the Santa Clara River went into effect on March 23, 2004. Nitrogen compounds can cause or contribute to eutrophic effects such as low dissolved oxygen, algae growth and reduced benthic macro invertebrates. The identified source of nitrogen compounds in the Santa Clara River are wastewater discharges, with possible other sources being agricultural runoff, stormwater runoff, groundwater discharge and atmospheric deposition. Given these sources, wasteload allocations for nitrogen compounds were assigned to the various sources (LARWQCB 2011).

In 2003 the SCVSD upgraded the treatment processes at the Valencia and Saugus WRPs to include nitrification/denitrification to address nutrients. The 2011 average ammonia levels in the Valencia and Saugus WRP recycled water were 1.02 and 1.32 mg/L, respectively. The 2011 average nitrate plus nitrite levels in Valencia and Saugus WRP recycled water were 2.60 and 4.36 mg/L, respectively (CLWA, et al. 2011).

The numerical TMDL targets established for ammonia and for nitrate plus nitrite are shown in Table 3.2-3 and Table 3.2-4, respectively. (As referred to in Tables 3.2-3 and 3.2-4, Reaches 7 ad 8 are the same as Reaches 5 and 6 referred to in Table 7.3-3 and elsewhere in this document).

The Santa Clara River is not longer considered to have impairments related to nitrate; the river no longer appears on the 303(d) list for nitrate.

TABLE 3.2-3
TMDL FOR AMMONIA ON THE UPPER SANTA CLARA RIVER

Reach	One-hour average NT[(a)] (mg-N/L)	Thirty-day average NT (mg-N/L)
Reach 8	14.8	3.2
Reach 7 above Valencia	4.8	2.0
Reach 7 below Valencia	5.5	2.0
Reach 7 at County Line	3.4	1.2

Source: *2010 Santa Clarita Valley* UWMP (CLWA, et al. 2011), based on LARWQCB Santa Clara River TMDL for Nitrogen Compounds Staff Report, June 2003.
Note: (a) NT = Numeric Target.

TABLE 3.2-4
TMDL FOR NITRATE PLUS NITRITE ON THE SANTA CLARA RIVER

Reach	Thirty-day Average (mg-N/L)
Reach 8	9.0
Reach 7	4.5

Source: *2010 Santa Clarita Valley* UWMP (CLWA, et al. 2011), based on LARWQCB Santa Clara River TMDL for Nitrogen Compounds.

3.2.1.4.2 Chloride

The Chloride TMDL was established due to the original listing of Reaches 5 and 6 of the Upper Santa Clara River for chloride on the 1998 303(d) list of impaired water bodies. Originally adopted in 2002, the most recent Basin Plan Amendment for this TMDL was unanimously adopted by the RWQCB in on December 11, 2008 with final approval by the US EPA on April 6, 2010. Beneficial uses currently impacted include salt-sensitive agriculture. Irrigation of salt sensitive crops such as avocados, strawberries, and nursery crops, with water containing high chloride levels allegedly results in reduced yields of such high value crops. Sources of chloride include self-regenerating water softeners, drinking water, and other additives that contribute to chloride in wastewater effluent. Wastewater discharges from the Saugus and Valencia WRPs were determined to be the principal source, making up an estimated 70 percent of the chloride load into Reaches 5 and 6 (LARWQB 2011).

The TMDL implementation schedule allows for several special studies to determine whether existing water quality objectives and waste-load allocations for chloride can be revised. The TMDL established final waste load allocations of 100 mg/L and higher conditional waste load allocations for the Saugus and Valencia WRPs, and provides for a 10-year schedule to attain compliance with the conditional water quality objectives and waste-load allocations for chloride. On October 28, 2013, the Santa Clarita Valley Sanitation District certified the Final Chloride Compliance Facilities Plan and associated Environmental Impact Report and approved a project consisting of ultraviolet disinfection, advanced treatment using reverse osmosis, and deep well injection for brine disposal, that complies with the final wasteload allocations of the chloride TMDL.

3.2.1.4.3 Bacteria

The upper Santa Clara River has been listed as impaired by elevated levels of indicator bacteria, starting in 1996 at Reach 6. During the 1998 Water Quality Assessment, Reaches 5 and 7 were also found to be impaired by high coliform counts and were added to the 303(d) List. Elevated bacterial indicator densities have shown to be closely related to adverse health effects and impair water quality for water contact recreation. As a result of this impairment to beneficial uses, the Indicator Bacteria TMDL was adopted by the RWQCB for all three reaches on July 8, 2010 and went into effect on March 21, 2012 (DOT 2011). Major contributors of bacteria to the Upper Santa Clara River are discharges from the stormwater conveyance system that drains urban areas. In contrast, runoff from natural landscapes has not been found to be a significant source of bacteria.

Numeric TMDL targets, expressed as allowable exceedance days, are used to calculate waste load and load allocations for non-point and point sources. They are based on an acceptable health risk for recreational waters as recommended by the US EPA and take into consideration that natural sources of bacteria exist that may cause or contribute to exceedances of objectives. Regulatory mechanisms that will be used to implement the adopted TMDL include the general NPDES permits, individual NPDES permits, MS4 Permits covering jurisdictions within the Upper Santa Clara River watershed, the Statewide Industrial Stormwater General Permit, the Statewide Stormwater Permit for Caltrans Activities, the Conditional Waiver for Irrigated Lands, Waste Discharge Regulations, and waivers thereof, as well as additional applicable California Water Code Sections and other appropriate mechanisms (LARWQCB 2010).

3.2.1.4.4 Trash

On March 6, 2008, a trash TMDL became effective for Lake Elizabeth, Munz Lake, and Lake Hughes. Sources of trash have been identified as litter from adjacent lands, roadways, and direct dumping, as well as storm drains. By 2011, targeted efforts in the vicinity of Munz Lake resulted in the finding that the lake was no longer impaired; however levels of trash discharges to Lake Elizabeth and Lake Hughes are still resulting in water quality objective violations. The beneficial uses being impacted are water contact and non-water contact recreation, warm freshwater and wildlife habitat, and rare and threatened species. Structural and non-structural best management practices have been identified as a means of addressing this TMDL (LARWQCB 2011). LA County completed the installation of the required five full-capture trash devices in September of 2012 and is thereby in full compliance of this TMDL.

3.2.2 Potable Water Quality

The previous section discussed water quality as it pertained to pollution and the natural environment. This section identifies water quality regulations related to potable water delivered to customers.

The quality of water received by individual customers will vary depending on whether they receive imported water, groundwater, or a blend. Some will receive only imported water at all times, while others will receive only groundwater. Others may receive water from one well at one time, water from another well at a different time, different blends of well and imported water at other times, and only imported water at yet other times. These times may vary over the course of a day, a week, or a year.

The following sections provide a general description of the water quality of both imported water and groundwater supplies as well as a discussion of potential water quality impacts on the reliability of these supplies.

3.2.2.1 Water Quality Constituents of Interest

Some contaminants are naturally-occurring minerals and radioactive material. In some cases the presence of animals or human activity can contribute to the presence of certain constituents in the source waters. The Santa Clarita Valley's water suppliers are committed to providing their customers with high quality water that meets all federal and state primary drinking water standards (CLWA, et al. 2011). Common water constituents that are regularly tested for, include metals and salts, disinfection by-products, microbial contaminants, radioactive compounds, organic compounds, and hardness. General findings are listed below and more details on these constituents can be found in the *2010 Santa Clarita Valley UWMP* and the *Santa Clarita Water Quality Report* (CLWA 2012). Perchlorate is an additional constituent that has been a water quality concern in the Region and is discussed in detail below.

- **Metals and Salts.** Metals and salts are tested in groundwater once every three years and in Castaic Lake water every month. Small quantities of naturally occurring arsenic are present in Castaic Lake and in groundwater wells; however arsenic levels are below the allowable drinking water maximum contaminant level (MCL). Maximum tested levels of chloride in water throughout the Santa Clarita Valley are all well below the minimum

MCL set for chlorides and nitrate levels in drinking water also meet federal and state MCL standards (CLWA 2012).

- **Disinfection By-Products.** CLWA uses ozone and chloramines to disinfect its water. Disinfection By-Products (DBPs), such as Trihalomethanes and Haloacetic Acids, are generated by the interaction between naturally occurring organic matter and disinfectants such as chlorine and ozone. Ozone is a very powerful disinfectant that can also interact with bromide, a naturally occurring salt, to produce bromate. The potable water systems are tested regularly for these constituents and levels are within drinking water standards (CLWA 2012).

- **Microbial Contaminants.** Microbiological drinking water tests are conducted weekly for total coliform bacteria. No *E. coli* was detected in any drinking waters in 2011. Additional microbiological tests for the water-borne parasites *Cryptosporidium parvum* and *Giardia lamblia* are performed on water from Castaic Lake and have been negative (CLWA 2012).

- **Radioactive Compounds.** Testing is conducted for alpha and beta radioactivitiy. If concentrations are measured above a given threshold, uranium and radium tests are also required. Current levels of radioactive compounds meet federal and state MCL standards (CLWA 2012).

- **Organic Compounds.** Castaic Lake and local wells are tested at least annually for volatile organic compounds and periodically for non-volatile synthetic organic compounds. Trichloroethylene and tetrachloroethylene have been found in trace levels in groundwater in the Valley, but test levels are below the MCL and generally below the detection limit for reporting (CLWA 2012).

- **Hardness.** Hard water is the primary complaint from Valley customers and despite the ban on automatic water softeners in the Valley, some households still use these units to remove hardness. In addition to having high operating costs, many of these units are designed to discharge a brine (salt) solution to the sanitary sewer system that is eventually discharged to the Santa Clara River (CLWA, et al. 2011).

- **Perchlorate.** Perchlorate, a chemical used in making rocket and ammunition propellants, has been a water quality concern in the Santa Clarita Valley since 1997 when it was originally detected in four Saugus Formation groundwater wells. To date, perchlorate has been detected in a total of 8 wells, in both the Saugus Formation and the Alluvium, including most recently in VWC's Saugus Well 201, in August 2010. Six wells were ultimately taken out of service upon the detection of perchlorate. All wells have either been (1) abandoned and replaced, (2) returned to service with the addition of treatment facilities that allow the wells to be used for municipal water supply as part of the overall water supply systems permitted by the California Department of Public Health (DPH) or (3) are targeted for treatment or replacement.

  Returning impacted wells to municipal water supply service by installing treatment requires DPH approval before the water can be considered potable and safe for delivery to customers. Before issuing a permit to a water utility for use of an impaired source, DPH requires that studies and engineering work be performed to demonstrate that pumping the well and treating the water will be protective of public health for users of the water. Ultimately, VWC's plan, as described below, and DPH requirements are intended to ensure that the water introduced to the potable water distribution system has no detectable concentration of perchlorate (CLWA, et al. 2011). A more detailed discussion on the perchlorate contamination and remediation efforts can be found below in Section 3.2.4.3.3.

- **Other.** Other water quality parameters that may pose more aesthetic concerns, such as the odor threshold, color and turbidity have also tested below drinking water MCLs (CLWA 2012).

3.2.3 Imported Water Quality

CLWA provides SWP water and other imported water to the Valley. The source of SWP water is rain and snow of the Sierra Nevada, Cascade, and Coastal mountain ranges. This water travels to the Delta through a series of rivers and various SWP structures. From there it is pumped into a series of canals and reservoirs, which provide water to urban and agricultural users throughout the San Francisco Bay Area and central and southern California. The southernmost reservoir on the West Branch of the SWP California Aqueduct is Castaic Lake. CLWA receives water from Castaic Lake and distributes it to the retail water purveyors following treatment.

Rio Vista Water Treatment Plant

As surface water is exposed to a variety of microbial contaminants, there are considerably more water quality regulations for surface water providers than apply to groundwater. CLWA has two surface water treatment plants, the Rio Vista Water Treatment Plant located in Saugus and the Earl Schmidt Water Filtration Plant located near Castaic Lake. Both of these plants have a multi-barrier strategy. The first barrier is the application of ozone, a powerful disinfectant, which has the ability to kill a broad range of microbes. The second barrier is the addition of chemicals to remove particles from the water, which can hide and protect microbes. Removing particles improves the anti-microbial action of the disinfectants. The water is then passed through two sets of filters, and chloramines are then added to the water. Chloramines contain chlorine and ammonia and prevent the growth of bacteria in the distribution system, which delivers water from the treatment plants to the retail water purveyors.

An important property of SWP water is the chemical make-up, which may fluctuate and is influenced by its passage through the Delta. The Delta is basically a very large marsh (or estuary) with large masses of plants and peat soils. These contribute organic materials to the water. Salt water can also move into the Delta from San Francisco Bay and the Pacific Ocean. This brings in salts, notably bromide and chloride. Chloride levels from the Delta may elevate local chloride levels. Additionally, disinfectant by-products (DBPs) are generated when bromide and organic materials react with disinfectants such as ozone and chlorine.

SWP water is generally low in dissolved minerals, such as calcium, magnesium, sodium, potassium, manganese, and nitrate. Dissolved mineral concentrations (total dissolved solids [TDS]) range between approximately 250 to 360 mg/L and hardness ranges between about 105 to 135 mg/L (as calcium carbonate). Historically, the chloride content of SWP water has varied widely from over 100 mg/L to below 40 mg/L, depending on Delta conditions. However, resulting from increased demand and dry period projections, a greater portion of water in the SWP has been pumped in from water banking programs, which can reduce peak chloride concentrations in SWP water (CLWA, et al. 2011).

As reported in the Water Quality Report (CLWA 2012), all constituents meet the federal and state drinking water standards, but management remains a concern in order to continue to provide highest quality water.

3.2.4 Groundwater Quality

Groundwater quality in the Region is generally good. Local groundwater generally does not have microbial water quality problems and has generally very little organic matter. The mineral content is fairly high, resulting in very “hard” groundwater, which although is not a health issue, is a water quality concern for this water resource. Presence of nitrate is an ongoing issue in the Agua Dulce groundwater basin where nitrate has been detected at levels exceeding drinking water standards. In the Acton Valley groundwater basin, elevated chloride, TDS, and sulfate levels have been detected and pose an ongoing water quality issue. In the Santa Clara River Valley East groundwater subbasin, the primary water quality concern has been perchlorate contamination.

3.2.4.1 Agua Dulce Groundwater Basin

The water quality in the Agua Dulce groundwater basin is generally calcium bicarbonate in character with a mixed calcium magnesium bicarbonate character deeper down. TDS ranges from 330 to 520 mg/L and total hardness ranges from 230 to 330 mg/L (Slade 2004). Although some random inorganic compounds have been detected, all levels have been well below the allowed MCLs. The major water quality issue for the basin is the presence of nitrate. Nitrate has been detected as high as 69.1 mg/L in one well in the basin, which exceeds the MCL of 45 mg/L for this constituent. More typical ranges for nitrate in the basin are between 20 and 40 mg/L (Slade 2004).

3.2.4.2 Acton Valley Groundwater Basin

Groundwater in this basin is generally classified as calcium-bicarbonate (DWR 2002a), although groundwater in the broad valley north of Acton exhibited calcium-magnesium bicarbonate to calcium-magnesium-sulfate character (Slade 1990). Based on sampling of 5 public water-supply wells, DWR reported TDS concentrations ranging from 424 to 712 mg/L, with an average concentration of 579 mg/L (DWR 2002a). During June 1988 to June 1989, the concentrations of TDS ranged from 279 to 480 mg/L, total hardness (TH) ranged from 172 to 271 mg/L, and nitrate concentrations ranged from 3.9 to 24.7 mg/L (Slade 1990, UWCD and CLWA 1996). The TDS content is greatly influenced by deep percolation of the rainfall runoff; it increases as rainfall declines and vice versa (UWCD and CLWA 1996).

DWR evaluation (DWR 2002a) indicated high concentrations of TDS, sulfate and chloride in 75 wells in the northern part of the basin, with some concentrations exceeding drinking water standards (Slade 1990; DWR 1993). Nitrate concentrations in two wells were above drinking water standards as well (DWR 1968).

3.2.4.3 Santa Clara River Valley East Groundwater Subbasin

As previously mentioned, this subbasin has two sources of groundwater. Most local wells draw water from the Alluvium whose quality is primarily influenced by precipitation and stream flow. A smaller portion of the Valley's water supply is drawn from the Saugus Formation, a much deeper aquifer than the Alluvium, which is recharged primarily by a combination of rainfall, where exposed, and deep percolation. The two aquifers' water quality changes at different rates and much more slowly than surface water.

Local groundwater generally does not have microbial water quality problems. Parasites, bacteria, and viruses are filtered out as the water percolates through the soil, sand, and rock on its way to the aquifer. Even so, disinfectants are added to local groundwater when it is pumped by wells to protect public health. Local groundwater has very little organic material and generally has very low concentrations of bromide, minimizing potential for DBP formation. Taste and odor problems from algae are not an issue with groundwater.

The mineral content of local groundwater is very different from SWP water. The groundwater is very "hard," in that it has high concentrations of calcium and magnesium (approximately 250 to 500 mg/L total hardness as CaCO3) (CLWA, et al. 2011). Groundwater may also contain higher concentrations of nitrates and chlorides when compared to SWP water. However, all groundwater meets or exceeds drinking water standards.

3.2.4.3.1 Groundwater Quality – Alluvium

Water quality in the Alluvium generally exhibits a "gradient" from east to west, with lowest dissolved mineral content to the east, and an inverse correlation with precipitation and streamflow, with a stronger correlation in the easternmost portion of the subbasin, where groundwater levels fluctuate the most. Wet periods have produced substantial recharge of higher quality (low TDS) water, and dry periods have resulted in declines in groundwater levels, with a corresponding increase in TDS (and individual contributing constituents) in the deeper parts of the Alluvium. The aquifer varies from calcium bicarbonate character in the east to calcium sulfate character in the west. Nitrate levels decline in the west and TDS levels increase (DWR 2002b).

The presence of long-term consistent water quality patterns, although intermittently affected by wet and dry cycles, supports the conclusion that the Alluvium is a viable ongoing water supply source in terms of groundwater quality. The most notable groundwater quality concern in the Alluvium is perchlorate, detailed in Section 3.2.4.3.3.

3.2.4.3.2 Groundwater Quality – Saugus Formation

Water quality in the Saugus Formation has not historically exhibited the precipitation-related fluctuations seen in the Alluvium. Based on available data over the last fifty years, groundwater quality in the Saugus had exhibited a slight overall increase in dissolved mineral content. More recently, several wells within the Saugus Formation exhibited an additional increase in dissolved mineral content, similar to short term changes in the Alluvium, possibly as a result of recharge to the Saugus Formation from the Alluvium. Since 2005, however, these levels have been steadily dropping or remained constant (CLWA, et al. 2011).

Dissolved mineral concentrations in the Saugus Formation remain below the Secondary (aesthetic) MCL. Groundwater quality within the Saugus will continue to be monitored to ensure that degradation does not threaten the long-term viability of the Saugus as an agricultural or municipal water supply. An ongoing water quality issue in the Saugus Formation is perchlorate contamination, detailed in Section 3.2.4.3.3.

3.2.4.3.3 Groundwater Contamination (Perchlorate) and Well Restoration

Perchlorate has been the most notable groundwater quality concern in the Santa Clarita Valley. To date, perchlorate has been detected in a total of 8 wells, in both the Saugus Formation and the Alluvium, including most recently in VWC's Saugus Well 201 in August 2010.

Table 3.2-5 summarizes the current remediation status of all wells where perchlorate has been detected.

TABLE 3.2-5
STATUS OF IMPACTED WELLS

Year Perchlorate Detected	Purveyor Well	Groundwater Aquifer	Status
1997	SCWD Saugus 1	Saugus	DPH approved returning the well to service in January 2011; well in active service utilizing approved perchlorate treatment.
1997	SCWD Saugus 2	Saugus	DPH approved wells return to service in January 2011; well in active service utilizing approved perchlorate treatment.
1997	VWC Well 157	Saugus	Sealed and capacity replaced by new well.
1997	NCWD Well 11	Saugus	Out of service.
2002	SCWD Stadium Well	Alluvium	Destroyed and capacity replaced by new well.
2005	VWC Well Q2	Alluvium	DPH approved perchlorate treatment removal in 2007; treatment was installed in 2005 and relocated for potential future use; well remains in service.
2006	NCWD Well N-13	Saugus	DPH approved quarterly monitoring, results have always been below the detection limit for reporting; well remains in service.
2010	VWC Well 201	Saugus	Out of service pending additional monitoring and evaluation of remediation alternatives.

Source: *2010 Santa Clarita Valley* UWMP (CLWA, et al. 2011).

Perchlorate was initially detected in 1997, in four wells operated by the purveyors in the eastern part of the Saugus Formation, near the former Whittaker-Bermite facility. In late 2002, the contaminant was detected in a fifth well, an Alluvium well (SCWD's Stadium Well) also located near the former Whittaker-Bermite site, which was immediately taken out of service and subsequently destroyed. Perchlorate was detected again in early 2005 in a second Alluvium well (VWC's Well Q2) near the former Whittaker-Bermite site, and in 2006 in very low concentrations (below the detection limit for reporting) in a Saugus well (NCWD's N-13) near one of the originally impacted wells.

In 2002 CLWA and the U.S. Army Corps of Engineers (ACOE) signed a cost-sharing agreement for a feasibility study of the area. Under federal and state law, the owners of the Whittaker-Bermite property have the responsibility for the groundwater cleanup. In February 2003, the California Department of Toxic Substances Control (DTSC) and the impacted purveyors entered into a voluntary cleanup agreement entitled *Environmental Oversight Agreement*. Under the Agreement, DTSC is providing review and oversight of the response activities being undertaken by CLWA and the purveyors related to the detection of perchlorate in the impacted wells. Under the Agreement's Scope of Work, CLWA and impacted purveyors prepared a Work Plan for sampling the production wells, a report on the results and findings of the production well sampling, a draft Human Health Risk Assessment, a draft Remedial Action Work Plan, an evaluation of treatment technologies and an analysis showing the integrated effectiveness of a project to restore impacted pumping capacity, extract perchlorate-impacted groundwater from two Saugus wells for treatment, and control the migration of perchlorate in the Saugus Formation. Based on treatment method pilot studies, selected ion exchange was determined to be the preferred treatment method for removing perchlorate. Environmental review of that project was completed in 2005 with adoption of a mitigated Negative Declaration. The Final Interim Remedial Action Plan for containment and extraction of perchlorate was completed and approved by DTSC in January 2006. Design and construction of the treatment facilities and related pipelines to implement the pump and treat program and to also restore inactivated municipal well capacity was completed in 2007. Treatment of the water began in 2010 and since 2011, the restored wells are now returned to service as part of the operational Saugus groundwater supply. In 2012, the Environmental Oversight Agreement was amended to include VWC Well 201.

In 2007, a final settlement was completed and executed to fund, remediate and treat the contaminated water from the impacted wells. The "Rapid Response Fund" established under this litigation settlement will be used if the remedy to contain perchlorate contamination in the Alluvium and portions of the Saugus Formation does not prevent migration of the perchlorate plume towards downgradient threatened wells (VWC Wells N, N-7, N-8, S6, S7, S8, 201 and 205 and NCWD Wells N-10, N-12 and N-13). The Rapid Response Fund provides up to $10 million for any additional costs of providing replacement water, associated operations and maintenance costs of treatment equipment and resin under the terms of the Agreement.

Most recently, in August 2010, perchlorate was detected in VWC's Saugus Well 201. Sampling in the months that followed confirmed the detection of perchlorate at concentrations that ranged from 5.7 to 16 micrograms per liter (µg/L). VWC removed Well 201 from service when perchlorate was first detected and is currently evaluating remediation alternatives, including wellhead treatment, in order to return the well to service and restore impacted well capacity.

Additional information on the perchlorate contamination and remediation efforts can be found in the *2010 Santa Clarita Valley UWMP* and through a DTSC information repository.

3.2.5 Water Quality Considerations for Recycled Water Use

The SWRCB adopted a statewide Recycled Water Policy (Policy) on February 3, 2009 to establish uniform requirements for the use of recycled water. The purpose of this Policy is to increase the use of recycled water from municipal wastewater sources in a manner that implements state and federal water quality laws. The Policy states that salts and nutrients from all sources, including recycled water, should be managed on a basin wide or watershed wide basis in a manner that ensures attainment of water quality objectives and protection of beneficial uses.

The Policy finds that the appropriate way to address salt and nutrient issues is through the development of regional or sub-regional salt and nutrient management plans rather than through imposing requirements solely on individual recycled water projects. Salt and nutrient plans must include a basin/sub basin wide monitoring plan that specifies an appropriate network of monitoring locations. The monitoring plan should be site specific and must be adequate to provide a reasonable, cost-effective means of determining whether the concentrations of salt, nutrients and other constituents of concern as identified in the salt and nutrient plans are consistent with applicable water quality objectives.

A salt and nutrient management plan is being prepared concurrently with this IRWMP Update. After appropriate public review, the salt and nutrient management plan and associated data will be finalized, made available to IRWMP Stakeholders and submitted to the LARWQCB.

3.2.6 Water Quality Impacts on Reliability

Since 1997, when perchlorate was originally detected in Valley groundwater supplies, the presence of this constituent has raised water quality concerns as well as concerns over the reliability of those supplies. The protection of groundwater sources (wells) from known contamination or provisions for treatment in the event of contamination is crucial to the availability and reliability of this water supply source. However, monitoring well installation has been completed; and a focused study of the Saugus Formation has ultimately been incorporated into the overall groundwater remediation and perchlorate containment efforts, which will enhance the reliability of groundwater in this region. All remedial action has now been reviewed by the DTSC.

Overall, the plans developed for groundwater operation will allow CLWA and the retail purveyors to meet near term and long term demand within the CLWA service area. No anticipated change in reliability or supply due to water quality is anticipated based on the present data.

3.3 Water Demand

A summary of the Region's historical water demand is provided below.

Figure 3.3-1 shows the historical use of all water supplies for municipal water uses, including local groundwater, imported water supplies and recycled water. As seen in the figure, this use

Heather Merenda

From: Lauren Everett <LaurenEverett@kennedyjenks.com>
Sent: Monday, July 18, 2022 9:52 AM
To: Heather Merenda
Subject: RE: Via Princessa on Round 2 List for Consideration
Attachments: USCR Project_Info_LongForm_IRWM Round 2_2022_UPDATEDTemplate.docx; USCR IRWM Project Idea Submission Form_2022_Template.xls

Good morning!

We are going to send out an email today (maybe tomorrow) for the next Stakeholder meeting and our call for projects. But I'll give you the info first!

All projects must submit a new project form (both are attached). Please use the long-form if you are seeking funding for Via Princessa and/or others. The short form can be used to ensure the project it included in the IRWM Plan itself. Send by August 22nd.

Let me know if you have any questions….

Hope you are well and looking forward to seeing you on zoom on the 28th!

Lauren

From: Heather Merenda <HMERENDA@santa-clarita.com>
Sent: Monday, July 18, 2022 8:48 AM
To: Cheryl Fowler <cfowler@scvwa.org>; Lauren Everett <LaurenEverett@kennedyjenks.com>
Subject: Via Princessa on Round 2 List for Consideration

Good morning

Could you please email me the excel spread sheet showing the projects under consideration for Round 2 funding that includes Via Princessa? Thank you

Heather Merenda, MPA
LEED Professional, CPSWQ, QSP
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DECEMBER 2015 – Revised February 2016

UPPER SANTA CLARA RIVER WATERSHED MANAGEMENT GROUP

Enhanced Watershed Management Program

submitted by

LARRY WALKER ASSOCIATES

TETRA TECH

PARADIGM ENVIRONMENTAL

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Executive Summary

The Upper Santa Clara River Enhanced Watershed Management Program Group (USCR EWMP Group), which includes the City of Santa Clarita (City), Los Angeles County (County), and Los Angeles County Flood Control District, collaboratively developed an Enhanced Watershed Management Program (EWMP) to comply with requirements in their Municipal Separate Storm Sewer System (MS4) Permit (Permit). The EWMP allows collaboration among agencies on multi-benefit regional projects to retain both non-stormwater and stormwater runoff, as well as to facilitate flood control and increase water supply.

The Santa Clara River watershed is distinctive compared to other watersheds in the region, in that it is predominantly open space - nearly ninety percent of the watershed is open space with approximately eighty-eight percent being undeveloped land. The watershed contains one of the last remaining natural rivers in Southern California. The Upper Santa Clara River watershed (USCRW) presents unique challenges for maintaining the balance of population growth, agricultural beneficial uses, conservation of endangered species habitat, floodplain management, water supply and wildlife corridors that depend on the Santa Clara River and its floodplain. A map of the USCRW, showing the EWMP area, County area, and Santa Clara River reach designations, is shown in **Figure ES-1**.

This EWMP has been developed to meet the state issued Permit requirements to protect these beneficial uses of the Upper Santa Clara River watershed receiving waters while recognizing these unique characteristics. The EWMP was developed through a stakeholder comment process involving Permittees as well as the Regional Board, United States Environmental Protection Agency (USEPA), nongovernmental organizations (NGOs), citizens, the development community, Santa Clarita Valley family of water providers, Santa Clarita Valley Sanitation Districts, Integrated Regional Water Management Group members and other interested parties. The components of the EWMP are summarized below.

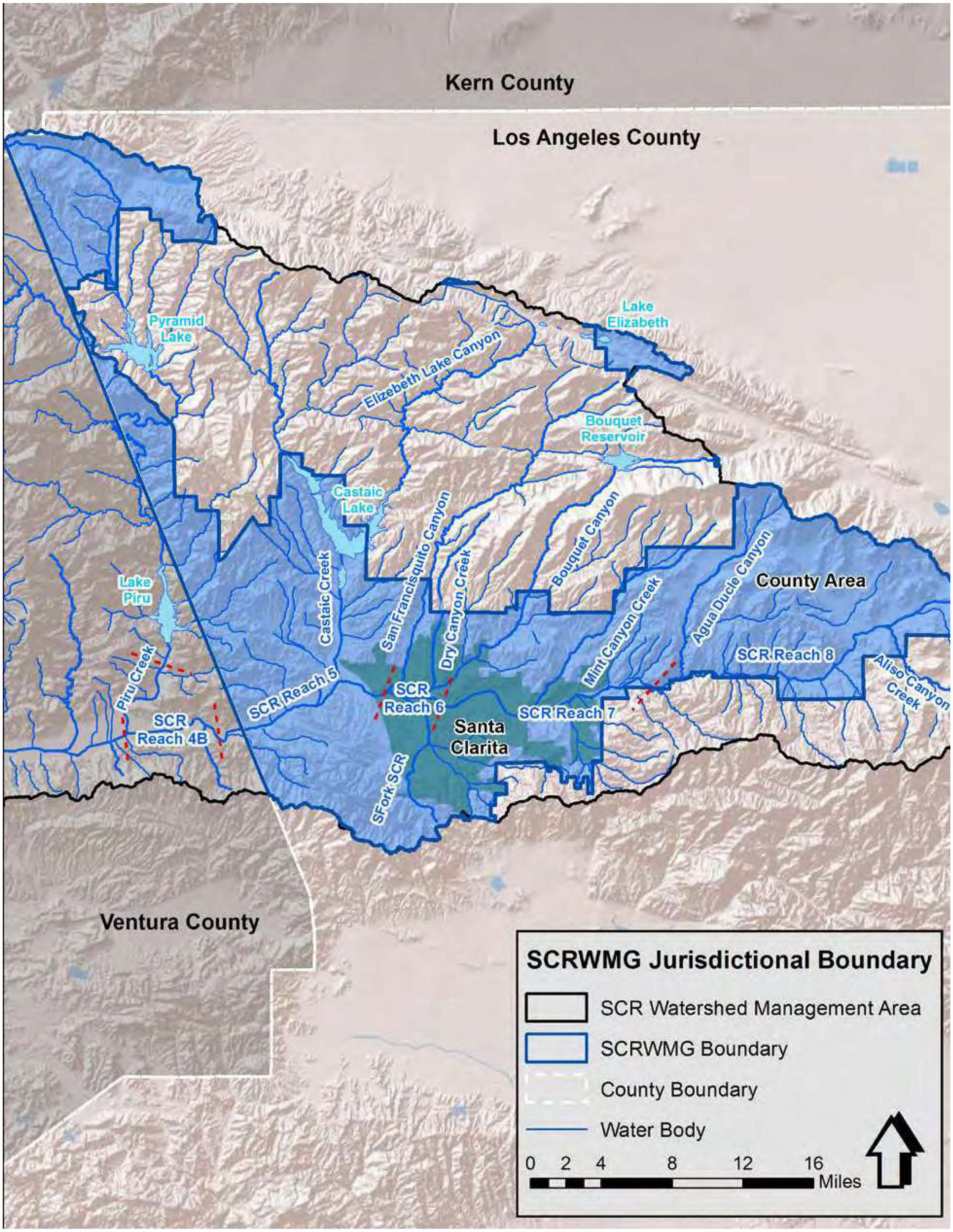

Figure ES-1. Upper Santa Clara Watershed Management Group EWMP Area

WATER QUALITY PRIORITIES

As the first step in the EWMP process, the water quality priorities were identified. The water quality priorities provide the basis for prioritizing selection and scheduling of control measures for the EWMP. The current water quality conditions, including both discharge and receiving water, were characterized based on a comparison of available data with applicable water quality objectives. Then, water body-pollutant combinations (WBPC) were classified according to the following three categories specified in the Permit:

> **Category 1 (Highest Priority)** -- WBPCs subject to an existing TMDL;
>
> **Category 2 (High Priority)** -- WBPCs that are either on the State Water Resources Control Board's 2010 Clean Water Act 303(d) list, or having sufficient exceedances to be listed; or
>
> **Category 3 (Medium Priority)** -- WBPCs with insufficient data to be included on the 303(d) list, but exceed applicable water quality objectives. Also includes water quality conditions that are not pollutants (for example, odor).

The categories were further subdivided to provide more support for the prioritization and sequencing of control measures in the EWMP, and constituents were assigned to classes. Pollutants in each class have similar fate and transport mechanisms and can be addressed by the same types of control measures.

A source assessment was conducted to identify potential sources for water quality priorities from MS4 discharges based on a review of available data and information. The source assessment provides a list of potential MS4 sources that are likely to be present in the USCR EWMP area and could be contributing to any exceedances observed in the receiving waters, which include the Upper Santa Clara River and its tributaries.

Based on the results of the classification and a source assessment, the priority constituents were identified. The prioritized constituents were utilized to direct the development of the EWMP towards the constituents of highest concern. The prioritized WBPCs are shown in **Table ES-1**.

Table ES-1. Prioritized WBPCs

Class	Constituent	Santa Clara River Reach				Lake Elizabeth
		4B[1]	5	6	7	
Priority 1: TMDLs[2]						
Bacteria	*E. Coli* (wet and dry)	X	X	X	X	
Salts	Chloride	X	X	X		
Trash	Trash					X
Priority 2: Other Receiving Water Considerations[2,3]						
Metals	Copper		X[4]	X	X[6]	
	Iron		X	X		
	Mercury		X[4]	X[5]	X[6]	
	Zinc			X[5]		
Selenium	Selenium			X[5]		
Cyanide	Cyanide			X[5]	X[6]	
Salts	TDS		X[4]			

1. Reach 4B is in Ventura County but was considered for the purposes of understanding downstream water quality.
2. Constituents with no exceedances within the past 5 years and WBPCs located in areas where MS4s are not a source contributing to the exceedances (categories 1D, 1E, 2C, 2D, 3C) are not considered to be priorities for the EWMP. Nitrogen compounds for SCR Reach 5, and chlorpyrifos and diazinon for Reach 6 are not prioritized for this reason.
3. Constituents contributing to impairments in Category 2B (e.g. toxicity, organic enrichment, etc.) are not yet identified and therefore cannot be specifically evaluated in the RAA analysis, and are not prioritized at this time.
4. Copper, mercury and TDS have been observed as exceeding applicable water quality objectives in Reach 5, and are prioritized as “other receiving water considerations” per Permit Provision 5.a.iv.2.a.
5. Mercury, zinc, selenium and cyanide have been observed as exceeding applicable water quality objectives in Reach 6, and are prioritized as “other receiving water considerations” per Permit Provision 5.a.iv.2.a.
6. Copper, mercury and cyanide have been observed as exceeding applicable water quality objectives in Reach 7, and are prioritized as “other receiving water considerations” per Permit Provision 5.a.iv.2.a.

WATERSHED CONTROL MEASURES

The Permit requires the identification of strategies, control measures, and best management practices (BMPs), collectively referred to in the Permit as Watershed Control Measures (WCMs), which could be implemented individually or collectively at the watershed-scale to comply with water quality objectives. The EWMP incorporates existing and planned stormwater BMPs, and also includes evaluations of additional potential control measures.

Two overarching categories of BMPs are included in the EWMP:

- **Structural BMPs** that retain, divert or treat stormwater and/or non-stormwater, and include low-impact development (LID), green streets/green infrastructure, and regional BMPs.
- **Institutional BMPs** that encompass the Minimum Control Measures (MCMs) outlined in the Permit, other non-structural BMP’s, and any other source control measures.

Structural BMPs will achieve the majority of required pollutant reduction required after source reduction measures have been implemented. Regional multi-benefit projects were prioritized in the EWMP development process, as emphasized in the Permit. Regional projects are centralized facilities located near the downstream ends of large drainage areas (typically treating 10s to 100s of acres). In identifying regional BMPs, consideration was also given to the variety of benefits beyond stormwater management that could be obtained through project implementation, including water supply augmentation, community enhancement, and habitat restoration.

The MCMs provided in the Permit were evaluated during EWMP development, and customized to address water quality priorities. The customization of MCMs was evaluated separately for the City and the County. Results of the evaluation demonstrated similarities in agencies' approaches to inspections and outreach programs. Both agencies intend to modify these types of programs to focus on the water quality priorities identified within the EWMP. In addition, the City identified several MCM modifications and enhancements to better coordinate with existing programs and provide additional focus on pollutants that are water quality priorities.

REASONABLE ASSURANCE ANALYSIS

A key component of the EWMP is the Reasonable Assurance Analysis (RAA), which uses computer modeling to demonstrate that the selected WCMs will result in compliance with applicable water quality-based effluent limitations (WQBELs) and receiving water limitations (RWLs) in Parts V.A and V1.E and Attachment L of the Permit. The RAA is a Permit required analysis to determine the full scope of what might be needed to meet water quality objectives. This analysis used a comprehensive watershed model of the entire Santa Clarita Valley area (the Watershed Management Modeling System, WMMS) that identifies cost-effective water quality improvements through an integrated, watershed-based approach. The WMMS incorporates three modeling tools to predict pollutant loading, simulate control measure performance, and optimize/select control measures based on cost-effectiveness.

The RAA was used to evaluate the many different scenarios/combinations of institutional, distributed and regional control measures that could potentially be used to comply with the Permit, and was then used to select the control measures specified in the EWMP Implementation Plan.

EWMP IMPLEMENTATION PLAN

The EWMP Implementation Plan outlines the proposed control measures and implementation process for the EWMP for the City and County to address Water Quality Priorities and comply with the provisions of the Permit based on the information available today. The plan may change over time through adaptive management based on monitoring results and updated modeling. Through the RAA, a series of quantitative analyses were used to identify the capacities of LID, green streets and regional BMPs that comprise the EWMP Implementation Plan. The RAA is also to assure those control measures will address the Water Quality Priorities and water quality objectives per the milestones/compliance schedules. Opportunities for regional BMPs that provide additional benefits beyond water quality improvements, with a focus on groundwater replenishment, have been identified and evaluated as part of the EWMP Implementation Plan. Additionally, enhanced MCMs, full capture devices for trash, and non-stormwater discharge investigations and abatement are components of the EWMP Implementation Plan. The EWMP Implementation Plan includes individual plans for each jurisdiction and each watershed/assessment area.

The scheduling and milestones for the EWMP have been carefully crafted to provide clear near term implementation actions and a structure for implementing additional actions to meet longer-term goals that leverage existing financial resources and account for the incorporation of future information. The scheduling of control measures for the EWMP Implementation Plan is based on the BMP-based milestones created by the USCR EWMP Group. The Group elected to develop milestones based on aggressive yet realistic implementation of institutional controls, high priority regional projects, and green streets over the next two five year Permit terms. Implementation actions after the first two permit terms will be evaluated and assessed in accordance with the adaptive management process and are subject to modification. The scheduling of the EWMP Implementation Plan to achieve EWMP milestones is shown in **Figure ES-2.**

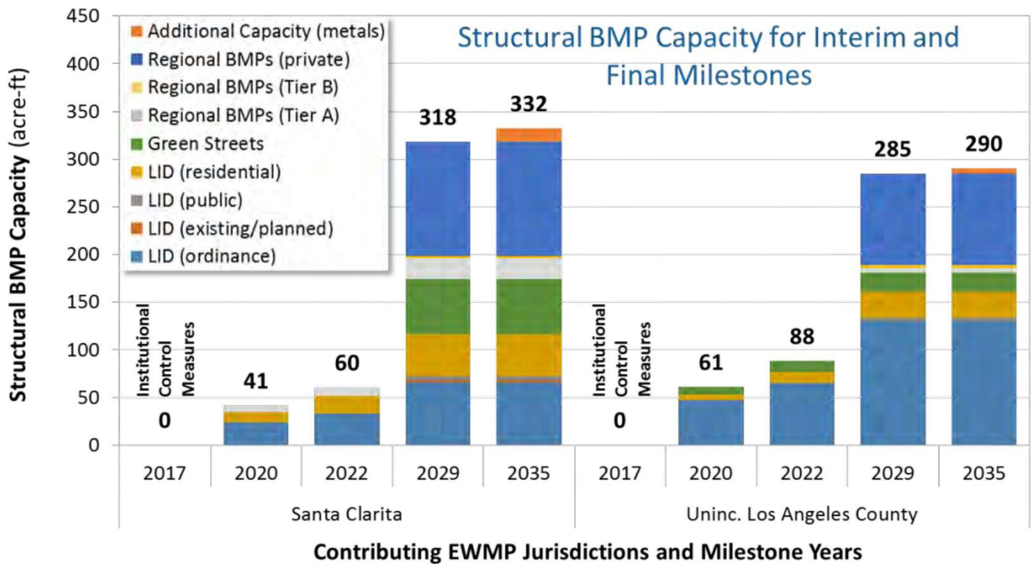

Figure ES-2. Scheduling of EWMP Implementation Plan to Achieve EWMP Milestones

COSTS AND FINANCIAL STRATEGY

The cost analysis estimates BMP-related costs associated with planning, design, permits, construction, operation, and maintenance for the selected WCMs. Planning-level construction capital costs for each milestone and for final compliance were developed using unit costs for individual construction components. The planning-level cost estimates are presented in **Table ES-2**. The implementation plan has been developed in consideration of the available financial resources and includes an implementation process that starts with the lowest cost actions (institutional controls/true source control) and progressively implements more costly controls by starting with high priority regional projects and projects on public lands, followed by implementation of projects on private parcels only if needed. The planning-level cost estimate is limited in that it does not consider the time value of money (interest, inflation, discount rates); operation and maintenance of structural facilities was assumed to be managed with existing resources; and unit costs did not take into account efficiencies in programmatic implementation or BMP construction.

While the RAA and Appendix C-3 provide a clear roadmap for regional project selection and execution in the near-term, the projects implemented under the EWMP will evolve over time to continue to identify and prioritize the best locations, sizes, and types of BMPs for pollutant reduction. Implementation of the regional BMP program will include methods to efficiently site, construct, maintain, and track regional BMPs. The program will consider not only the interactions between BMPs and their environmental factors, but also consider synergies and integration with concurrent drinking water, wastewater, and other engineering programs. In the developing Santa Clara River Valley, a regional BMP program is also particularly important in that undeveloped land can be identified, acquired (if necessary), and dedicated to multi-benefit projects *before* it is developed.

5.2.2 Highest-Priority (Tier A) Regional Control Measures

Multi-benefit regional projects are prominently featured in the Permit as "signature" components of the EWMP. This section highlights six specific highest-priority (Tier A) regional projects which the City and County have identified for the EWMP Implementation Plan.

Figure 5-6 shows the location of six example Tier A projects which are briefly described below. Detailed fact sheets for all Tier A candidates are provided in Appendix C-6, and Appendix C-9 provides conceptual designs for the projects detailed below.

Note that these projects are only a subset of all regional projects included in the EWMP. Appendix C-3 discusses the additional Tier A and Tier B regional projects. The approach/assumptions for representing regional BMPs in the RAA is described in Section 6.3, and the sequencing for implementing regional projects is discussed in Section 7. Projects were sized to capture and retain the 85th percentile design storm where practicable.

Site 3b: Newhall Park

Description

Runoff will be diverted to a subsurface cistern or infiltration chamber from an existing 90-inch storm drain. This project has potential to augment local water supply both through groundwater recharge or storage and use for onsite irrigation.

Key Facts

Owner:	City of Santa Clarita
Drainage Area:	415 acres
Parcel Size:	14 acres
BMP Capacity:	9.7 acre-ft *(retains 85th%-ile)*

Site 7: Hasley Canyon Park

Description

Runoff will be directed to a subsurface cistern or infiltration chamber from an existing 84-inch storm drain. This project has potential to augment local water supply both through groundwater recharge or storage and use for onsite irrigation.

Key Facts

Owner:	County of LA
Drainage Area:	187 acres
Parcel Size:	12 acres
BMP Capacity:	4.9 acre-ft *(retains 85th-%ile)*

Site 25: Canyon Country Park

Description

Runoff will be captured in a subsurface cistern or infiltration chamber from two storm drains that currently traverse the parcel. This project has potential to augment local water supply both through groundwater recharge or storage and use for onsite irrigation.

Key Facts

Owner:	**City of Santa Clarita**
Drainage Area:	**77 acres**
Parcel Size:	**2 acres**
BMP Size:	**2.8 acre-ft** ***(retains 85th%-ile)***

Site 26: Pico Canyon Park

Description

Runoff will be treated by regional and "naturalized" bioretention facilities incorporated into the existing park. In addition to water quality benefits, this retrofit could provide public outreach benefits and would be an ideal volunteer project.

Key Facts

Owner:	**LA County**
Drainage Area:	**38 acres**
Parcel Size:	**21 acres**
BMP Size:	**0.6 acre-ft (retains 85th%-ile)**

Site 26: Jake Kuredjian Park

Description

Runoff will be directed to a subsurface cistern or infiltration chamber from multiple existing storm drains. This project has potential to augment local water supply both through groundwater recharge or storage and use for onsite irrigation.

Key Facts

Owner:	**LA County**
Impervious Drainage Area:	**438 acres**
Parcel Size:	**6 acres**
BMP Size:	**8.0 acre-ft** ***(sized for water quality)***

Site X: Santa Clara River Floodplain

Description

Runoff from an existing concrete channel will be diverted to an infiltrating wetland basin along the bank of the Santa Clara River. This project was the potential to augment local water supply and provide opportunities for public education and recreation.

Key Facts

Owner:	**LA County**
Drainage Area:	**982 acres**
Parcel Size:	**27 acres**
BMP Size:	**18 acre-ft (retains 85th%-ile)**

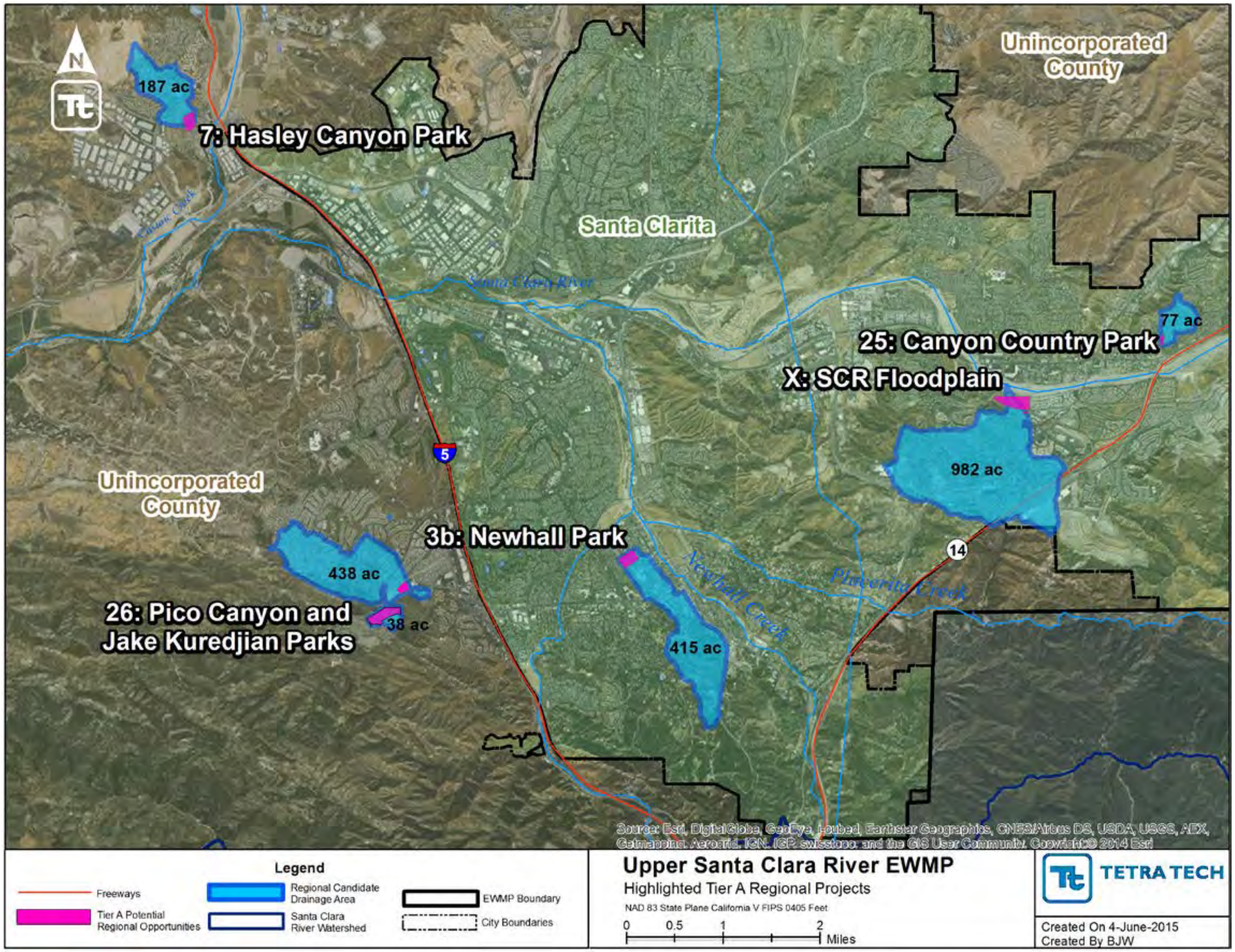

Figure 5-6. Map of Six Highlighted Tier A Projects

Notes: Site numbers correspond to identifiers listed above and in Appendix C

ATTACHMENTS FOR SECTION 2.1:

CONFIGURATION

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CITY OF SANTA CLARITA - VIA PRINCESSA PARK & BMP PROJECT

VIA PRINCESSA PARK

1. 180' X 300' MP FIELD WITH 25' BUFFER
2. PEDESTRIAN AND MAINTENANCE VEHICLE TUNNEL (RESTRICTED ACCESS FOR MAINTENANCE VEHICLES) WITH PUBLIC ART LIGHTING + MURALS
3. AMENITY BUILDINGS: (2 BUILDINGS) 8 RESTROOM STALLS + (1) SECURITY
4. 10' TALL RETAINING WALL + MONUMENT PARK SIGN AT ENTRY "VIA PRINCESSA PARK"
5. ENTRY GATHERING PLAZA WITH SHADE, PARK INFORMATIONAL KIOSK, PUBLIC ART + SEATING
6. WAYFINDING "HONBY CHANNEL" MONUMENT SIGN WITH EDUCATION INTERPRETATION
7. WAYFINDING "SANTA CLARA RIVER" PLAZA + MONUMENT SIGN WITH SHADE, SEATING + EDUCATION COMPONENTS
8. VEHICULAR ACCESS ROAD OVER HONBY CHANNEL
9. NEW EXTENDED STORM DRAIN CULVERT PER CIVIL
10. EMERGENCY VEHICLE HAMMERHEAD TURN-AROUND
11. SHADED PICNIC AREA (LARGE GROUPS)
12. SHADED PICNIC AREA (STANDARD GROUP)
13. NATURAL PLAY AREA INTEGRATED WITH STORMWATER BIOSWALES, STORMWATER COLLECTION SWALES DIRECTS STORMWATER TO BMP INTAKE
14. NATURE THEMED PLAYGROUND
15. SHADED BERM SEATING
16. SPORTS FIELD LIGHTING
17. BANK PROTECTION
18. EXISTING VIA PRINCESSA TRAIN STATION PARKING LOT WITH 400 PARKING SPACES
10. EXISTING RESTROOM + SECURITY FACILITY
20. SUBGRADE INFILTRATION BMP
21. MAINTENANCE VEHICLE ACCESS ROAD
22. NEW COVERED TRASH ENCLOSURE FOR (3) 5 YD DUMPSTERS
23. NEW BUS TURNAROUND, NEW ASPHALT
24. NEW PARKING AISLE WITH NEW PARKING SPACES, LANDSCAPE AREAS AND NEW FENCE AROUND PERIMETER
25. NEW PARKING STALLS (EXISTING PARKING LOT)
26. HONBY CHANNEL RESTORATION
27. LANDSCAPE AREA TO HELP PROMOTE NATURAL SUCCESSION OF PLANTING ON THE WEST SIDE OF HONBY CHANNEL
28. CENTRAL ACCESSIBLE PATH WITH SHADE AND SEATWALLS
29. NEW LANDSCAPE AREAS
30. DESERT SCRUB HYDROSEED MIX - THESE PLANTS DON'T NEED IRRIGATION AFTER ESTABLISHMENT
31. CORDOVA ESTATES PLANTED BUFFER
32. EXISTING STORM OUTLET
33. SEATWALL
34. SPECTATOR TURF CUTOUTS
35. SPECTATOR BERM SEATING
36. RETAINING SEATWALLS
37. SPLIT-RAIL FENCING AROUND PLAYGROUND
38. SERVICE VEHICLE ACCESS LOOP DOUBLES AS BURIED BANK LINER ALONG NORTH AND WEST SIDE OF PROPERTY, ALSO SERVES AS MULTI-MODAL PATHWAY, MIMICKING THE SHAPE AND GEOMORPHOLOGY OF RIVERS
39. SERVICE VEHICLE AT-GRADE CROSSING WITH HAMMERHEAD TURN-AROUND
40. CRISS-CROSS CANVAS SHADE STRUCTURES
41. WOODEN SHADE STRUCTURES
42. SHADED BIKE PARKING AND BIKE AMENITIES
43. ARCHWAY ENTRY WALK
44. PLAY BERMS
45. NATURAL PLAYGROUND
46. DIVERSION STRUCTURE IN HONBY CHANNEL
47. PRE-TREATMENT DEVICE
48. DIVERSION PIPE

LANDSCAPE AREAS + HARDSCAPES

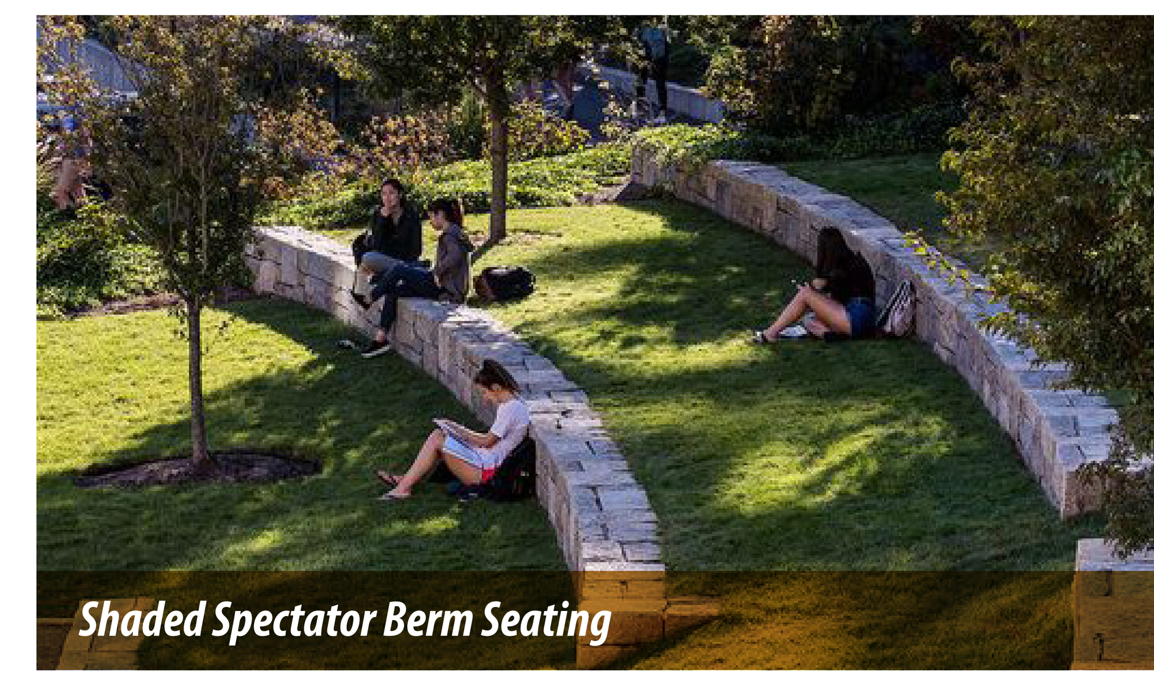
- LOW WATER ADAPTIVE PLANTING SLOPES
- LOW WATER ADAPTIVE PLANTING
- BIOSWALES
- LOW-MOW LAWN
- DECOMPOSED GRANITE/COMPACTED DIRT
- VEHICULAR CONCRETE
- CONCRETE PAVERS

CIRCULATION + SYMBOLOGY

- WATER TUNNEL EDUCATION + ART PIECE
- WATER EDUCATION + PUBLIC ART OPPORTUNITY
- ECOLOGY + STEWARDSHIP EDUCATION + PUBLIC ART OPPORTUNITY
- GEOLOGY EDUCATION OPPORTUNITY
- WAYFINDING
- PUBLIC ART

Gathering Space / Public Art / Trails

Nature Themed Playground



Shaded Spectator Berm Seating

Educational + Public Art Components

CONCEPTUAL PLAN

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CITY OF SANTA CLARITA - VIA PRINCESSA PARK & BMP PROJECT CONCEPTUAL PLAN

URBAN ARCHITECTURE / RECREATION

1. 180' X 300' MP FIELD WITH 25' BUFFER
3. AMENITY BUILDINGS: 8 RESTROOM STALLS + SECURITY
5. ENTRY GATHERING PLAZA WITH SHADE, PARK INFORMATIONAL KIOSK, PUBLIC ART + SEATING
11. SHADED PICNIC AREA (LARGE GROUPS)
12. SHADED PICNIC AREA (STANDARD GROUP)
13. NATURAL PLAY AREA INTEGRATED WITH STORMWATER BIOSWALES, STORMWATER COLLECTION SWALES DIRECTS STORMWATER TO BMP INTAKE
14. NATURE THEMED PLAYGROUND
15. SHADED BERM SEATING
33. SEATWALL
34. SPECTATOR TURF CUTOUTS
35. SPECTATOR BERM SEATING
36. RETAINING SEATWALLS
37. SPLIT-RAIL FENCING AROUND PLAYGROUND
40. CRISS-CROSS CANVAS SHADE STRUCTURES
41. WOODEN SHADE STRUCTURES
42. SHADED BIKE PARKING AND BIKE AMENITIES
43. ARCHWAY ENTRY WALK
44. PLAY BERMS
45. NATURAL PLAYGROUND

LANDSCAPE AREAS + HARDSCAPES

- LOW WATER ADAPTIVE PLANTING SLOPES
- LOW WATER ADAPTIVE PLANTING
- BIOSWALES
- LOW-MOW LAWN
- DECOMPOSED GRANITE/COMPACTED DIRT
- VEHICULAR CONCRETE
- CONCRETE PAVERS

CIRCULATION + SYMBOLOGY

- WATER TUNNEL EDUCATION + ART PIECE
- WATER EDUCATION + PUBLIC ART OPPORTUNITY
- ECOLOGY + STEWARDSHIP EDUCATION + PUBLIC ART OPPORTUNITY
- GEOLOGY EDUCATION OPPORTUNITY
- WAYFINDING
- PUBLIC ART

1 *180' x 300' MP Fields with 25' Buffer*

14 *Nature Themed Playground*

11 *Gathering Space + Shaded Picnic Area*

13 *Natural Play Area Integrated with Stormwater Bioswales*

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CITY OF SANTA CLARITA - VIA PRINCESSA PARK & BMP PROJECT CONCEPTUAL PLAN

TRAILS, PATHWAY + COMMUNITY ENGAGEMENT

2 PEDESTRIAN AND MAINTENANCE VEHICLE TUNNEL (RESTRICTED ACCESS FOR MAINTENANCE VEHICLES) WITH PUBLIC ART LIGHTING + MURALS

4 10' TALL RETAINING WALL + MONUMENT PARK SIGN AT ENTRY "VIA PRINCESSA PARK"

5 ENTRY GATHERING PLAZA WITH SHADE, PARK INFORMATIONAL KIOSK, PUBLIC ART + SEATING

6 WAYFINDING "HONBY CHANNEL" MONUMENT SIGN WITH EDUCATION COMPONENTS

7 WAYFINDING "SANTA CLARA RIVER" PLAZA + MONUMENT SIGN WITH SHADE, SEATING + EDUCATION COMPONENTS

8 VEHICULAR ACCESS ROAD OVER HONBY CHANNEL

10 EMERGENCY VEHICLE HAMMERHEAD TURN-AROUND

21 MAINTENANCE VEHICLE ACCESS ROAD FOR BMP SYSTEM

28 CENTRAL ACCESSIBLE PATH WITH SHADE AND SEATWALLS

38 SERVICE VEHICLE ACCESS LOOP DOUBLES AS BURIED BANK LINER ALONG NORTH AND WEST SIDE OF PROPERTY, ALSO SERVES AS MULTI-MODAL PATHWAY, MIMICKING THE SHAPE AND GEOMORPHOLOGY OF RIVERS

39 SERVICE VEHICLE AT-GRADE CROSSING WITH HAMMERHEAD TURN-AROUND

43 ARCHWAY ENTRY WALK

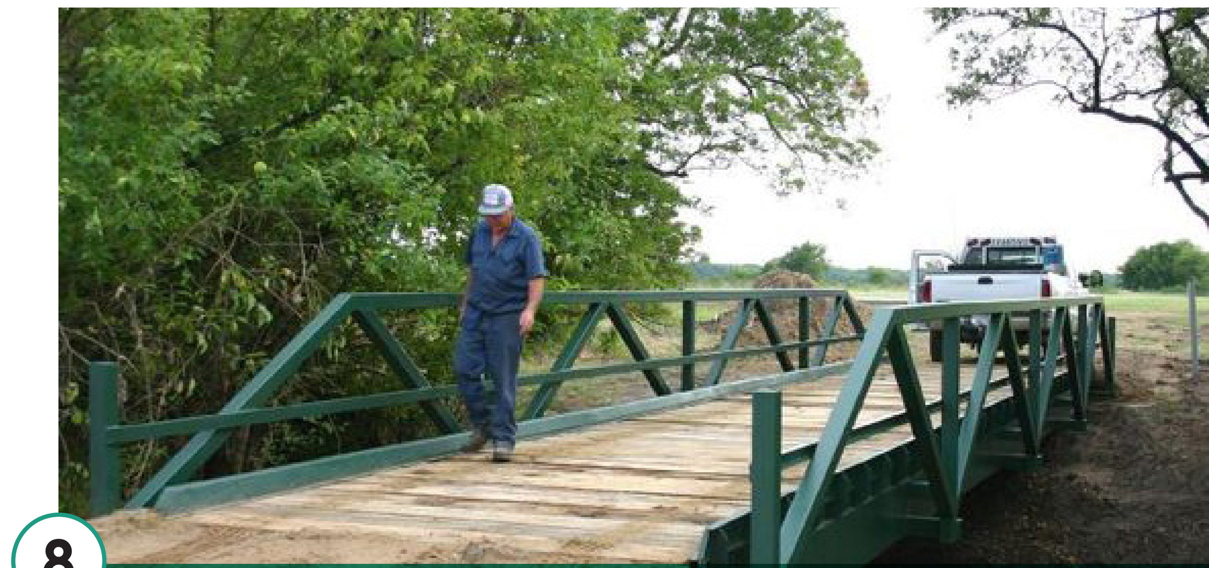
LANDSCAPE AREAS + HARDSCAPES

- LOW WATER ADAPTIVE PLANTING SLOPES
- LOW WATER ADAPTIVE PLANTING
- BIOSWALES
- LOW-MOW LAWN
- DECOMPOSED GRANITE/COMPACTED DIRT
- VEHICULAR CONCRETE
- CONCRETE PAVERS

CIRCULATION + SYMBOLOGY

- WATER TUNNEL EDUCATION + ART PIECE
- WATER EDUCATION + PUBLIC ART OPPORTUNITY
- ECOLOGY + STEWARDSHIP EDUCATION + PUBLIC ART OPPORTUNITY
- GEOLOGY EDUCATION OPPORTUNITY
- WAYFINDING
- PUBLIC ART

2 Pedestrian + Maintenance Vehicle Tunnel with Public Art, Lighting + Murals



8 Vehicular Access over Honby Channel

5 New Landscape Areas Drought Tolerant, Regionally Adapted Plants

4 Monument Park Sign at Entry

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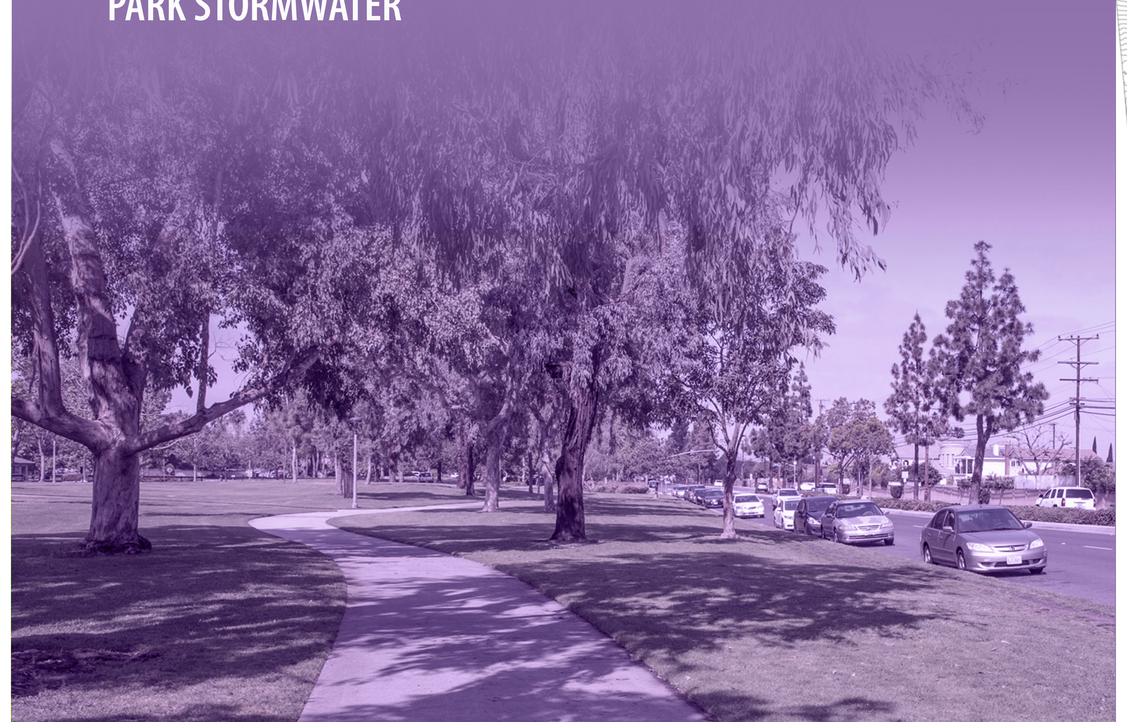
CITY OF SANTA CLARITA - VIA PRINCESSA PARK & BMP PROJECT CONCEPTUAL PLAN

DRAINAGE + STORMWATER

- ⑨ NEW EXTENDED STORM DRAIN CULVERT PER CIVIL
- ⑬ NATURAL PLAY AREA INTEGRATED WITH STORMWATER BIOSWALES, STORMWATER COLLECTION SWALES DIRECTS STORMWATER TO BMP INTAKE
- ⑳ SUBGRADE INFILTRATION BMP
- ㉖ HONBY CHANNEL RESTORATION
- ㉜ EXISTING OUTLET
- ㊻ DIVERSION STRUCTURE IN HONBY CHANNEL PARK STORMWATER
- Ⓐ DRAINAGE CONNECTION TO HONBY CHANNEL
- Ⓑ PARKING STALLS W/ PERVIOUS PAVERS
- Ⓒ ROCK GARDEN / INFILTRATION TRENCH
- Ⓓ STORMWATER BIORETENTION RAIN GARDEN
- Ⓔ GREEN SPACE VEGETATED BUFFER
- Ⓕ ENHANCED BIOSWALE BIORETENTION



LANDSCAPE AREAS + HARDSCAPES
- LOW WATER ADAPTIVE PLANTING SLOPES
- LOW WATER ADAPTIVE PLANTING
- BIOSWALES
- LOW-MOW LAWN
- DECOMPOSED GRANITE/COMPACTED DIRT
- VEHICULAR CONCRETE
- CONCRETE PAVERS

CIRCULATION + SYMBOLOGY
- WATER TUNNEL EDUCATION + ART PIECE
- WATER EDUCATION + PUBLIC ART OPPORTUNITY
- ECOLOGY + STEWARDSHIP EDUCATION + PUBLIC ART OPPORTUNITY
- GEOLOGY EDUCATION OPPORTUNITY
- WAYFINDING
- PUBLIC ART
- BELOW SURFACE STORM DRAIN PIPES
- SURFACE FLOW DIRECTION
- CULVERT FACE

LID COMPONENTS

13 *Natural Play Area Integrated with Stormwater Bioswales*

D *Rain Garden*

13 *Rock Garden / Infiltration Rock Garden*

B *Pervious Pavers*

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CITY OF SANTA CLARITA - VIA PRINCESSA PARK & BMP PROJECT CONCEPTUAL PLAN

NATURE-BASED LANDSCAPE PLAN

- 13 NATURAL PLAY AREA INTEGRATED WITH STORMWATER BIOSWALES, STORMWATER COLLECTION SWALES DIRECTS STORMWATER TO BMP INTAKE
- 27 LANDSCAPE AREA TO HELP PROMOTE NATURAL SUCCESSION OF PLANTING ON THE WEST SIDE OF HONBY CHANNEL
- 29 NEW LANDSCAPE AREAS
- 30 DESERT SCRUB HYDROSEED MIX - THESE PLANTS DON'T NEED IRRIGATION AFTER ESTABLISHMENT
- 31 CORDOVA ESTATES PLANTED BUFFER
- A BUFFER ZONE (Cordova Estates)
- B SLOPE STABILIZATION AT BANK LINER (3:1 Slope)
- C POLLINATOR GARDEN
- D REGIONALLY ADAPTED/ FORMALIZED PARK PLANTING
- E BIOSWALES + STORMWATER
- F HYDROSEED, DESERT SAGE SCRUB + WEST PARK
- G RIPARIAN CORRIDOR + BANK STABILIZATION

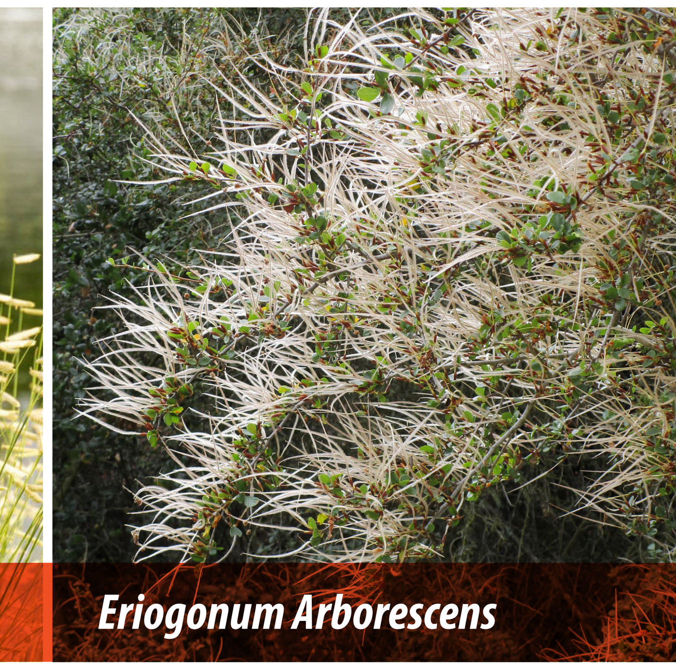
LANDSCAPE AREAS + HARDSCAPES

- LOW WATER ADAPTIVE PLANTING SLOPES
- LOW WATER ADAPTIVE PLANTING
- BIOSWALES
- LOW-MOW LAWN
- DECOMPOSED GRANITE/COMPACTED DIRT
- VEHICULAR CONCRETE
- CONCRETE PAVERS

CIRCULATION + SYMBOLOGY

- WATER TUNNEL EDUCATION + ART PIECE
- WATER EDUCATION + PUBLIC ART OPPORTUNITY
- ECOLOGY + STEWARDSHIP EDUCATION + PUBLIC ART OPPORTUNITY
- GEOLOGY EDUCATION OPPORTUNITY
- WAYFINDING
- PUBLIC ART

A *Bouteloua Gracilis*



Eriogonum Arborescens

D *Calistemon Viminalis 'Little John'*

Cercidium x Desert Museum

E *Juncus Patens 'Elk Blue'*

Iris Douglasiana

F *Encelia Farinose*

Sphaeralcea Ambigua

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CITY OF SANTA CLARITA - VIA PRINCESSA PARK & BMP PROJECT CONCEPTUAL PLAN

REGIONAL STORMWATER INFILTRATION BMP

20 SUBGRADE INFILTRATION BMP

26 HONBY CHANNEL RESTORATION

46 DIVERSION STRUCTURE IN HONBY CHANNEL

47 PRE-TREATMENT DEVICE

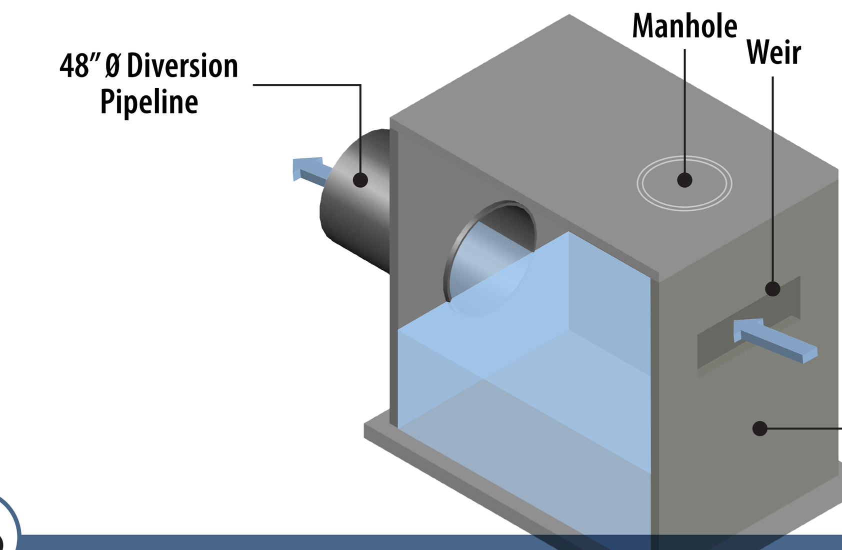
48 DIVERSION PIPE

LANDSCAPE AREAS + HARDSCAPES

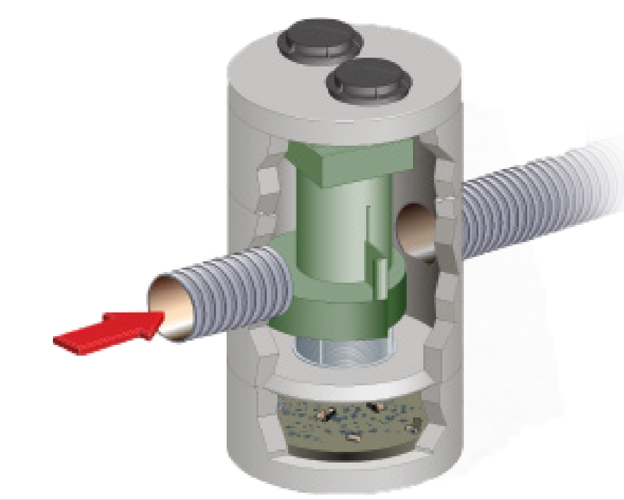
- LOW WATER ADAPTIVE PLANTING SLOPES
- LOW WATER ADAPTIVE PLANTING
- BIOSWALES
- LOW-MOW LAWN
- DECOMPOSED GRANITE/COMPACTED DIRT
- VEHICULAR CONCRETE
- CONCRETE PAVERS

CIRCULATION + SYMBOLOGY

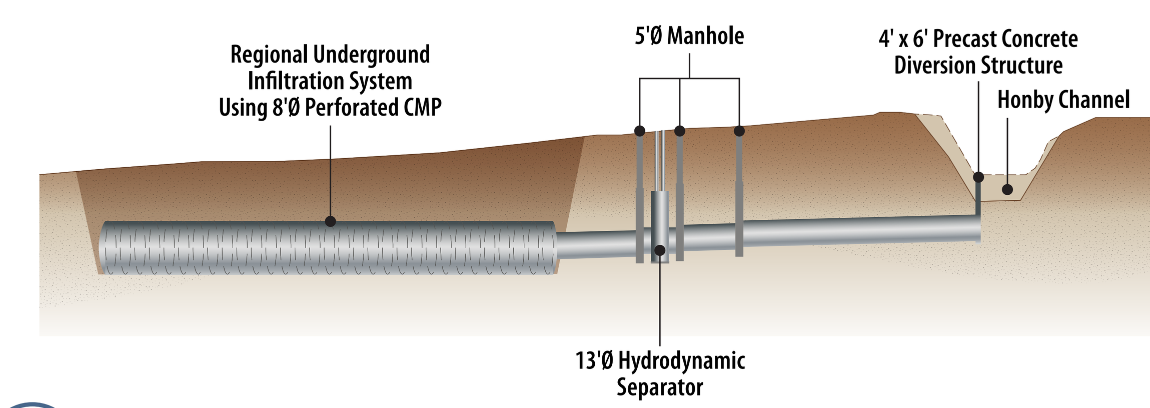
- WATER TUNNEL EDUCATION + ART PIECE
- WATER EDUCATION + PUBLIC ART OPPORTUNITY
- ECOLOGY + STEWARDSHIP EDUCATION + PUBLIC ART OPPORTUNITY
- GEOLOGY EDUCATION OPPORTUNITY
- WAYFINDING
- PUBLIC ART
- BELOW SURFACE STORM DRAIN PIPES
- SURFACE FLOW DIRECTION
- CULVERT FACE



46 *Diversion Structure*



26 *Pre-Treatment – Hydrodynamic Separator*



20 *Infiltration BMP Profile / Cross Section*

46 *Honby Channel Restoration*

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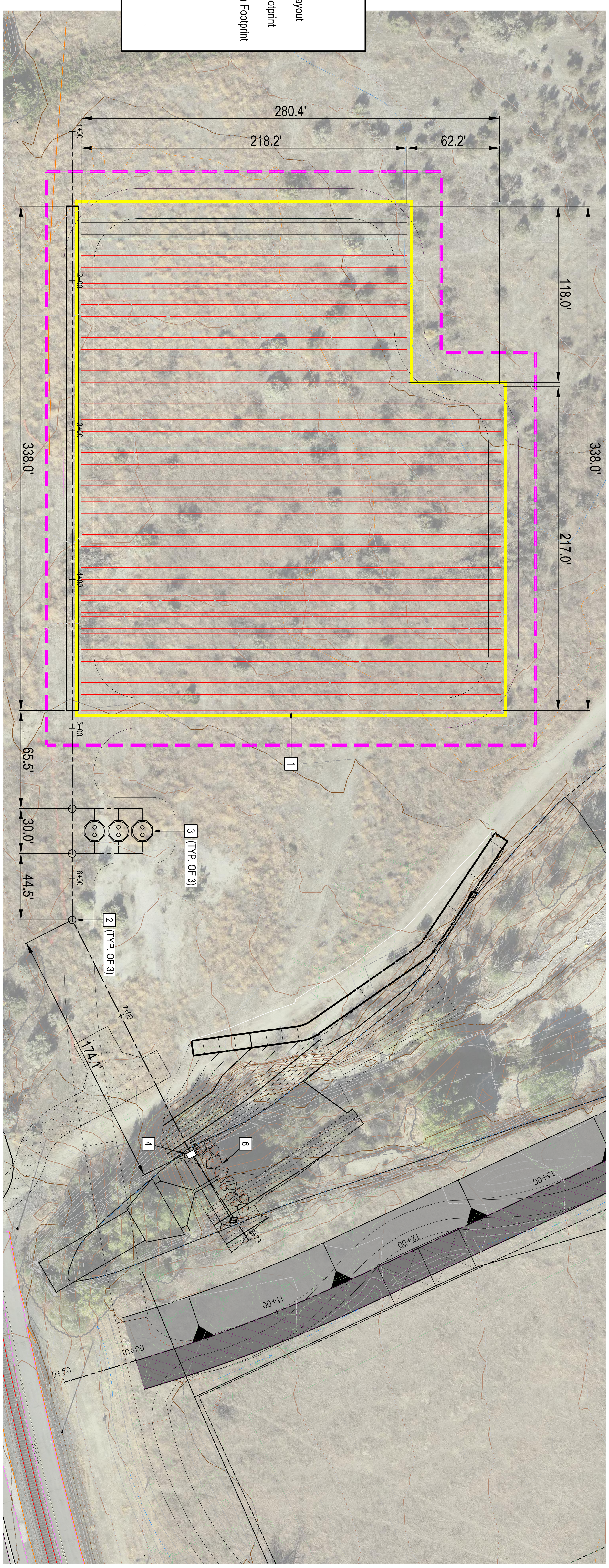
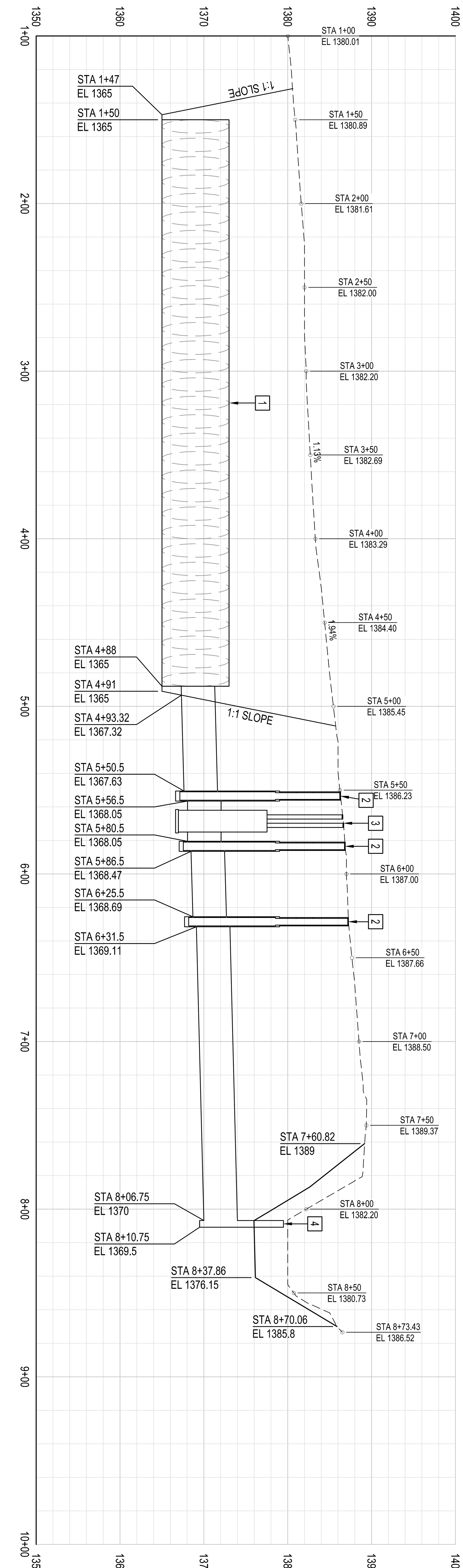
Dimscale = 1; LTscale = 1; PSltscale = 1; ACAD Ver. = 23.0s (LMS Tech); Visretain = 1

LEGEND

- Parcel Boundaries
- PACE Proposed 8' Dia. CMP Layout
- PACE Proposed BMP Invert Footprint
- PACE Approx. BMP Excavation Footprint
- Proposed Bank Protection
- 2021 Vertex Survey Boundary
- Major Contour
- Minor Contour



PROFILE
SCALE: 1" = 40'



PROFILE
1" = 40' HORIZ
1" = 8' VERT

CONSTRUCTION NOTES

1. REGIONAL UNDERGROUND INFILTRATION SYSTEM USING 8Ø PERFORATED CMP
2. 5Ø MANHOLE
3. 13Ø HYDRODYNAMIC SEPARATOR
4. 4' x 6' PRECAST CONCRETE DIVERSION STRUCTURE
5. 48"Ø PVC STORM DRAIN
6. ROCK CHECK DAM WITH WEEP HOLES FOR DRY WEATHER FLOW

SHEET	2
JOB NO.	B894

PACE
Advanced Water Engineering
17520 Newhope Street, Suite 200 | Fountain Valley, CA 92708
P: (714) 481-7300 | www.pacewater.com

JOB
VIA PRINCESSA PARK
REGIONAL INFILTRATION BMP
SANTA CLARITA CA

Infiltration BMP Components Plan & Profile

PREPARED BY	PACE
PROJECT ENGINEER	
R.C.E. NO. --	DUONG DO
EXP. x/xx/xx	
DRAWN C.T.	SCALE 1" = 80'
DESIGNED C.T.	
CHECKED D.D	DATE 02-16-2022

NO	BY	DATE	REVISIONS	DATE	APP.

W:\B894\Engineering\GlobalExhibits\B894 - BMP Plan & Profile.dwg - Tab: BMP Layout - by wwright on 05/12/22 at 1:58:57 PM

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ATTACHMENTS FOR SECTION 2.2:

CAPTURE AREA

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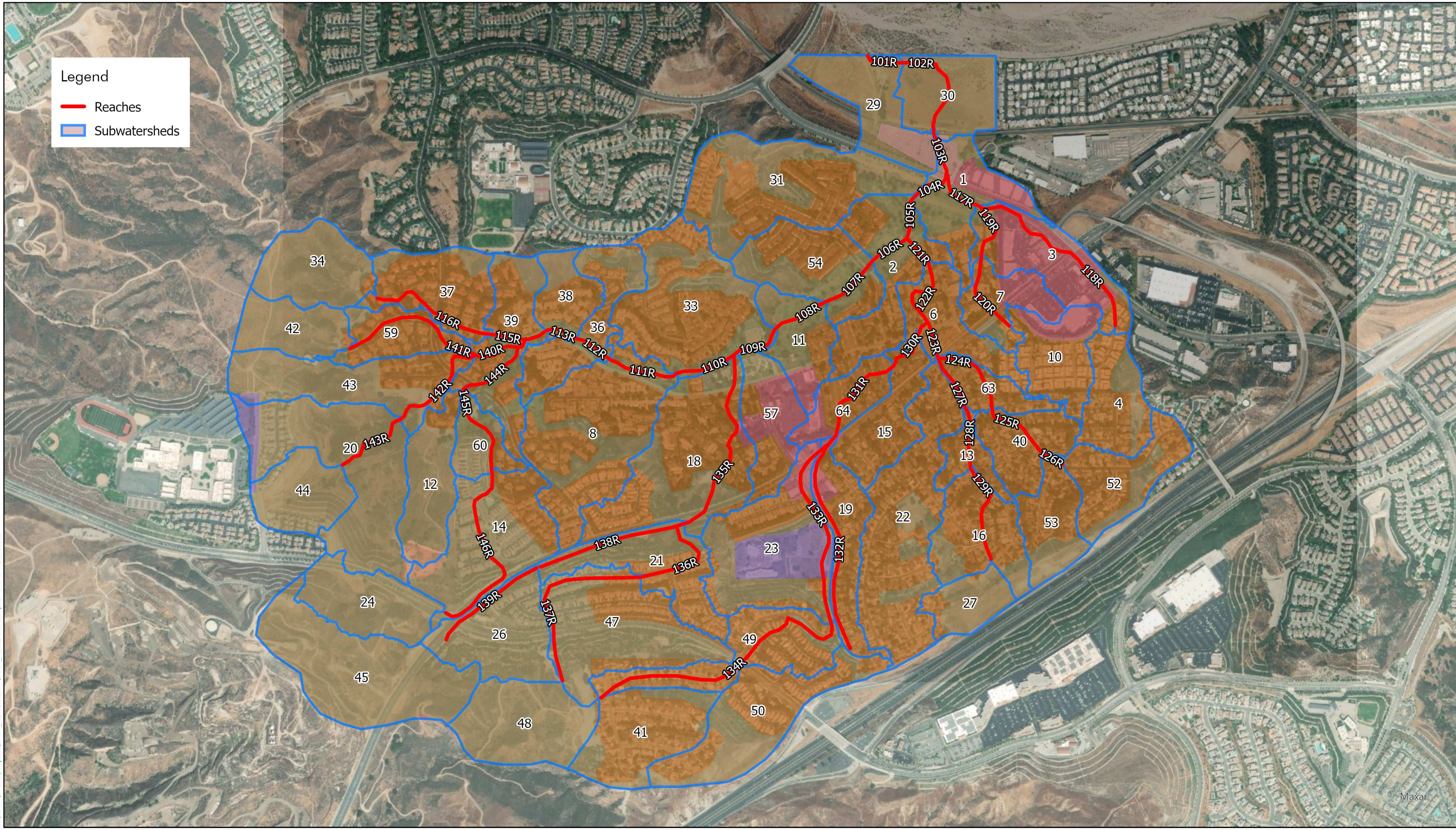


VIA PRINCESSA INFILTRATION FACILITY

WATERSHED WORKMAP

PACE Advanced Water Engineering

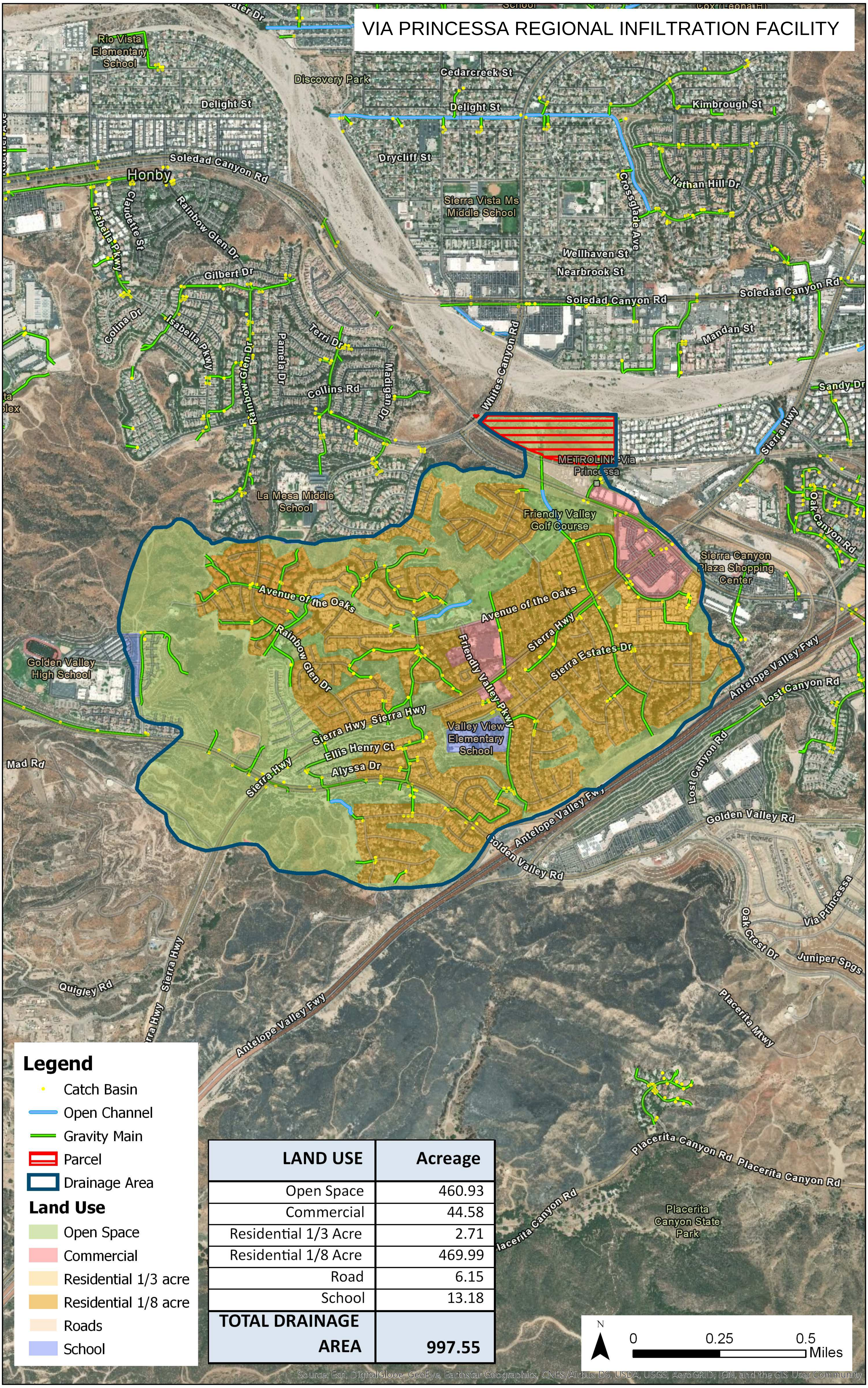
N

0 450 900 1,800 Feet

Date: 10/11/2021

Job Number: B351

P:\B351\6-GIS\Projects\B351_SantaClarita\B351_SantaClarita.aprx - Site X Watersheds



LAND USE	Acreage
Open Space	460.93
Commercial	44.58
Residential 1/3 Acre	2.71
Residential 1/8 Acre	469.99
Road	6.15
School	13.18
TOTAL DRAINAGE AREA	997.55

ATTACHMENTS FOR SECTION 2.4:

SITE CONDITIONS & CONSTRAINTS

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GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

March 30, 2022

Pacific Advanced Civil Engineering
17520 Newhope Street, Suite 200
Fountain Valley, California 92708

Job No. 2018-003-054

Attention: Mr. Duong Do, P.E.

Subject: Report of Geotechnical Investigation and Infiltration Study
Proposed Site X Regional Infiltration BMP
Northwest of Existing Via Princessa Metrolink Station
Santa Clarita, California

Reference: See Attached List of References

Gentlemen:

This Report of Geotechnical Investigation and Infiltration Study presents the results of our site investigation and in-situ infiltration testing that was performed to help support the design of the proposed Regional Infiltration BMP on the Site X site (the site). This report also includes general geotechnical recommendations for minor improvements during site development. The work was performed in consideration of the Los Angeles County Department of Public Works (LACDPW), Administrative Manual GS 200.2, "Guidelines for Geotechnical Investigation and Reporting, Low Impact Development (LID) Storm Water Infiltration," dated June 30, 2017 (LACDPW, 2017).

Included with and completing this report are References, a Geotechnical Plot Plan (Figure 1), a Historically Highest Ground Water Contour Map (Figure 2), a Water Well Location Map (Figure 3), Explorations (Appendix A), Laboratory Test Data (Appendix B), Infiltration Test Data and Calculations (Appendix C), Water Well Records (Appendix D), and Geosyntec Technical Memorandum (Appendix E).

SITE HISTORY

R.T. Frankian & Associates (RTF&A) initially performed a subsurface investigation to provide preliminary geotechnical characteristics of the site and preliminary estimates of permeability for the underlying soil based on soil types (RTF&A, 2019). The initial investigation was performed in October and November 2018 and included advancing a total of 12 Cone Penetrometer Test (CPT) soundings to depths varying from about 12 to 44 feet below the existing ground surface. Following our initial investigation, we received a plan entitled “Site X CPT Location Map,” dated January 2018, prepared by Pacific Advanced Civil Engineering (PACE) which provided the outline of an “infiltration gallery” and a “most likely location of BMP” for the site and the location of a proposed offsite diversion structure. The plan provided two locations for in-situ infiltration testing to be performed on the site and one offsite testing location for the proposed diversion structure. Infiltration testing was to be performed within hollow stem borings at a depth of about 20-feet below existing ground surface. . The excavation of hollow stem borings and in-situ infiltration testing was performed in January 2022.

Evaluation of site geology and hydrogeology was provided by Geosyntec Consultants within their Technical Memorandum, entitled “Desktop Analysis Site Evaluation,” dated January 15, 2019 (Geosyntec, 2019).

SITE DESCRIPTION

The proposed Site X site is approximately 8-acres in size and is bounded by the Santa Clara River to the north, the Honby Creek to the east, Via Princessa Road to the south and Whites Canyon Road to the west; the Southern California Regional Rail Authority (SCRRA) Metrolink easement runs along the southern side of the site. The site is relatively level with elevations ranging from approximately 1,387 feet above mean sea level (msl) to about 1,370 feet msl trending south to north toward the river. Our understanding is that site improvements will include the construction of a subterranean storm water BMP treatment basin with an approximate area of about two-acres; the basin will consist of perforated, corrugated metal pipe, installed at a depth of about 20-feet below the existing ground surface. The proposed offsite storm drain diversion structure is to be located within the existing Metrolink Station parking lot on the south side of SCRRA easement. The location of the proposed storm water treatment basin and diversion structure is shown on the attached Geotechnical Plot Plan (Figure 1) based upon the project Preliminary BMP Layout Plan, prepared by PACE, dated February 16, 2022.

SUBSURFACE EXPLORATIONS

As mentioned above, a subsurface investigation was initially performed in October and November of 2018 (RTF&A, 2019). The primary purpose of the initial investigation was to provide preliminary geotechnical characteristics of the site and preliminary estimates of permeability of the underlying soil based on soil type to provide preliminary guidance in the design and location of proposed storm water treatment basin. The investigation included advancing a total of 12 CPT soundings (CPT-1 through CPT-12) to depths varying from about 12 to 44 feet below the existing ground surface. A CPT truck was utilized to obtain the soundings. The soundings were used to identify the engineering characteristics of the materials below the site, to aid in the determination of liquefaction potential, as well as indicate the presence of groundwater. Soil samples were obtained from the CPT soundings for laboratory testing. The locations of the CPT soundings are shown on the attached Geotechnical Map (Figure 1). The logs from previously obtained CPT soundings are presented in Appendix A of this report.

A subsequent investigation was performed in January 2022 which included the excavation of four borings to depths varying from about 20 to 50 feet below existing ground surface. A truck-mounted, hollow-stem auger drill rig with 8-inch diameter augers, was used to excavate the borings. Three of the borings (IB-1, IB-2 and B-4) were drilled on the Site X site while a fourth boring (B-3) was drilled within the existing Metrolink Station parking lot for a proposed diversion structure. Infiltration test wells were installed in two of the borings (IB-1 and IB-2) for infiltration testing. Soil samples were obtained from the borings for laboratory testing, which included relatively undisturbed driven “ring” samples, bulk samples from drill cuttings, and samples from a split-tube Standard Penetration Test (SPT) sampler. The locations of the hollow-stem borings are shown on the attached Geotechnical Map (Figure 1). The boring logs are presented in Appendix A of this report.

SOIL CONDITIONS

The result of the hollow stem borings and the CPT soundings indicate that the site is primarily underlain by naturally deposited soils. In general, the upper surficial soils at the site consist of silty sands and sandy silts that were found to be relatively moist and moderately dense, extending to about 1 to 3 feet below the present site grades. The upper surficial soils were underlain by alternating layers of clean sands and silty sands that were found to be dense. The CPT soundings indicated an occasional layer of clayey silt to silty clay within the upper 4 to 5-feet of CPT-2 and CPT-8.

The result of the offsite boring that was drilled within the Metrolink Station parking lot indicates the area of the proposed diversion structure is underlain by approximately 19-feet of existing fill soils. It is assumed that these fills were placed as part of the grading for the bus return at the existing Metrolink Station parking lot. The fill materials generally consist of silty sands and appear to be well compacted. The fill materials are underlain by naturally deposited soils.

Variations of the materials encountered are indicated in the attached hollow stem boring and CPT sounding logs are presented in Appendix A of this report. Groundwater was not encountered in the borings drilled.

LABORATORY TESTING

Laboratory tests were performed on selected samples, obtained from the CPT soundings and hollow-stem test borings, to aid in the classification of the soils and to determine the pertinent engineering properties of the soils. The laboratory tests performed included moisture content and dry density determinations, sieve analyses, R-value tests and corrosion tests. The results of the moisture content and dry density tests are indicated on the boring logs while the remaining test results are presented in Appendix B of this report.

GEOLOGIC CONDITIONS

As previously mentioned, evaluation of geology for the site was provided by Geosyntec Consultants within their Technical Memorandum, entitled "Desktop Analysis Site Evaluation," dated January 15, 2019 (Geosyntec, 2019) that is presented in Appendix E. As stated in their memorandum, the site geology is composed of recent Quaternary unconsolidated sands and gravels of primary fluvial deposition.

GROUNDWATER HYDROLOGIST

The RTF&A authorized scope of work was based on Geosyntec performing the additional work outlined in their Technical Memorandum (Geosyntec, 2019) in addition to the work to be performed by the groundwater hydrologist required as outlined in the LACDPW Administrative Manual GS 200.2 (LACDPW, 2017). This was to include additional evaluation of mounding and impacts on adjacent properties and existing improvements such as the railroad tracks, bridge, roadway abutments, and bridge foundations. However, it is our understanding that funding for this work was not yet released and Geosyntec was not yet authorized to perform this work. It is recommended that this work be performed prior to construction of the proposed infiltration system.

GROUNDWATER

Groundwater was not encountered during our subsurface investigations performed for the site. The previous CPT soundings and hollow stem borings were advanced to a maximum depth of about 50-feet below existing ground surface and did not encounter groundwater.

The California Geological Survey (CGS) provides data relative to historic high groundwater contours for use in seismic hazard evaluations. Historic high ground water contours for the site are indicated within the "Seismic Hazard Zone Report for the Mint Canyon 7.5-Minute Quadrangle" (CGS, 1998); the site is generally located between the 15-foot and 25-foot deep groundwater contours shown on the map. The historic high groundwater contours from the Seismic

Hazard Zone Report (CGS, 1998) are presented on the attached Historically Highest Ground Water Contour Map (Figure 2).

A total of three water wells are also located within 1000-feet of the site as indicated on the attached Water Well Location Map (Figure 3). Water well records from the Los Angeles County Department of Public Works (LACDPW) identify the wells as Well Nos. 7139E, 7139F and 7139G. The well records provide significant information relative to groundwater elevations, however, there have been no groundwater measurements within the last several years. The water well records are presented in Appendix D of this report. A summary of water level measurements recorded for the wells are presented in following tables.

LATEST GROUNDWATER DATA

LACO Well ID	Date Measured	Approximate GS Elevation	Approximate GW Elevation	Approximate Depth to GW
7139E	06/01/2012	1372	1287	85’
7139F	06/01/2012	1375	1290	85’
7139G	11/01/2012	1380	1299	81’

HISTORIC HIGHEST GROUNDWATER DATA

LACO Well ID	Date Measured	Approximate GS Elevation	Approximate GW Elevation	Approximate Depth to GW
7139E	04/30/1983 01/30/1984	1372	1359	13’
7139F	04/30/1983	1375	1367	8’
7139G	04/30/2005	1380	1370	10’

CONCLUSIONS

The following conclusions are based upon information obtained in the preparation of this report, review of our referenced report that included information for the subject site (RTF&A,2019), and work performed by Geosyntec (Geosyntec, 2019).

Depth to groundwater ranges from 10 up to 97 feet below ground surface (bgs) with an average depth to groundwater of about 44 feet bgs from 1983 to 2012. Based on numerous Geosyntec assumptions, maximum groundwater mounding was modeled to be approximately 32 feet beneath the center of the infiltration basin. Assuming groundwater level fluctuations are consistent with past trends, groundwater will come within 10 feet of the bottom of the infiltration basin following particularly wet winters that receive periods of prolonged and heavy precipitation. Using the 10 feet of clearance between the bottom of the basin of 17 feet (current infiltration depth is 20 feet), the recurrence interval for high groundwater that may reach this elevation is 7 to 10 years that can be mitigated by the bypass of stormwater in order to maintain the County guidance of 10 vertical feet between groundwater and the infiltration discharge point (Geosyntec, 2019).

INFILTRATION STUDY

A field infiltration study was performed at the site to determine the feasibility of infiltrating collected storm water into the site soils. Infiltration testing for the subject site was coordinated with representatives of the City of Santa Clarita and PACE in consideration of the LACDPW Administrative Manual GS 200.2 (LACDPW, 2017). It was determined that infiltration testing would consist of two tests performed using the Boring Percolation Test Procedure in 8-inch diameter drilled hollow-stem borings at a depth of about 20 feet below existing ground surface; it is our understanding that large scale percolation tests were not desired at this time due to budgetary constraints.

We were provided a plan entitled “Site X CPT Location Map,” dated January 2018, prepared by PACE which provided the outline of an “infiltration gallery” and a “most likely location of BMP” for the site. The plan provided two locations for in-situ infiltration testing to be performed for the site. It was proposed that the infiltration testing be performed within hollow stem borings at a depth of about 20-feet below existing ground surface.

SUMMARY OF TESTING

Infiltration testing was performed in January 2022 and consisted of two tests performed using the Boring Percolation Test Procedure within 8-inch diameter drilled hollow-stem borings (IB-1 and IB-2), as planned. Each of the tests were performed at a depth of approximately 20-feet below existing ground surface. A summary of the test procedures is included with Appendix C of this report.

INFILTRATION TEST RESULTS

When the Boring Percolation Test procedure is performed, the County guidelines dictate that several reduction factors be applied to the infiltration rates obtained in the field when designing LID features. The field infiltration rates for the two infiltration borings were recorded and are presented in the summary presented below. However, when County-recommended corrections for borehole diameter (RFt) are applied, it results in a reduction of the field infiltration rates. The County requires additional reduction factors for site variability, number of tests, and thoroughness of investigation (RFv) as well as for long-term siltation, plugging, and maintenance (RFs).

The County indicates that a reduction factor of 2 should be used for the boring percolation test method (RFt). Based on the subject geotechnical investigation and our infiltration testing, a value of 2 was used for RFv. A value of 2 was also used for long-term siltation, plugging, and maintenance (RFs). The RFs value of 2 is based on future infiltration systems being maintained on a bi-annual basis and some form of pre-treatment being provided. These reduction factors may be increased or decreased by the infiltration designer and are to be based upon their experience, recommendations for maintenance, and specific design details of the infiltration system.

As a result of the field testing, and when all of the various County mandated reduction factors are applied, it is recommended that the infiltration rates provided in the following table be used in the design for LID features at the site. LID features should be designed to infiltrate within the sandy, naturally deposited soils that are expected to be present at the depths and locations of where our infiltration testing was performed.

The boring field infiltration test results and correction factors are summarized in the table presented below. The infiltration testing results are also summarized in the "Boring Percolation Testing Field Logs" included in Appendix C of this report.

Infiltration Location	Approximate Infiltration Test Elevation (in feet)	Material at Infiltration Elevation	Field Infiltration Rate* (in/hr)	Boring Reduction Factor (RFt)	Boring Corrected Field Infiltration (in/hr)	RFv	RFs	Design Infiltration Rate (in/hr)
IB-1	1362	silty sand	46.80	2	23.40	2	2	5.85
IB-2	1361½	silty sand	22.24	2	11.12	2	2	2.78

* Average of last three readings
** For LID features established in naturally deposited sandy soils

CONCLUSIONS

As summarized in the above table, each of the tests meet the minimum infiltration requirement of at least 0.3 inches per hour as required within the LACDPW Administrative Manual GS 200.2 (LACDPW, 2017). The application of average infiltration rates, as indicated on the attached Preliminary BMP Layout Plan (Figure 2), was coordinated with the BMP designer based on the recommended design infiltration rates shown above.

Groundwater was not observed during our site investigation. Boring B-4 was drilled to an approximate elevation of 1,331 msl and did not encounter ground water. CPT-1 sounding was advanced to a depth of about 44-feet and also did not encounter ground water. The historically high groundwater map developed by CGS would suggest a conservative historically high ground water elevation of below 1,360 msl. The latest readings of the three adjacent LACDPW water wells indicate water levels that varied from 81- to 85-feet below ground surface at elevations varying from approximately 1287 to 1299 msl. The LACDPW Administrative Manual GS 200.2 (LACDPW, 2017) indicates that existing groundwater data may be used to verify the seasonal high groundwater elevation.

The proposed invert elevations, based on a depth of approximately 20-feet below existing ground surface, would vary from approximately 1360 to 1361 msl. The site generally meets the minimum seasonal high groundwater criteria of greater than 10-feet below the proposed invert of infiltration based upon the data contained herein. However, as discussed in the attached Geosyntec Technical Memorandum (Geosyntec, 2019), it is expected that during periods of heavy rainfall it would be necessary to bypass the infiltration system to maintain a vertical distance of 10 feet between high groundwater and the bottom of the proposed infiltration system.

SOIL CEMENT

An evaluation of the characteristics and distribution of in-place materials for the use in constructing an on-site soil cement liner was beyond the scope of the current work authorization. Based on our experience on multiple soil cement liner projects in the Santa Clarita Valley and the field investigation with laboratory testing presented in this report, portions of the existing on-site materials are considered suitable for soil cement liner construction. Once details regarding the proposed bank protection are available, we recommend that a site-specific geotechnical investigation and aggregate evaluation of subsurface soils in the vicinity of the proposed soil cement liner be performed. This work should include performing temporary slope stability calculations and obtaining representative samples of on-site materials to determine tentative mix-design cement contents; the representative samples should be mixed with various cement contents with compression testing of aged specimens. Temporary slope stability calculations to support temporary backcut gradients should also be performed as part of this work. This recommended additional work is intended to provide a more detailed assessment relative to the suitability of on-site soils for use as aggregate and to support the soil cement liner construction from a geotechnical perspective.

Plans showing the location and details of the proposed soil cement are not currently available. The following should be considered as preliminary general recommendations and should be updated and/or revised once soil cement plans and specifications are available.

GENERAL

Soil cement used in the bank protection should be mixed, placed, and compacted in accordance with generally accepted procedures by a contractor experienced in constructing soil cement bank protection. Representatives of the Geotechnical Consultant should observe and test the soil cement during on-site batching and placement. The following recommendations should be incorporated into the specifications for the soil cement bank protection.

CONSTRUCTION

The soil cement should be placed in compacted layers about 8 inches in thickness and should be compacted to at least 95 percent of its maximum dry density at no more than 2 percent over optimum moisture content for the soil cement mix as determined using ASTM Test Method D558, modified to use ASTM D1557 compaction effort, or as specified by the soil cement design engineer.

SOIL CEMENT MIX

The native on-site alluvial soils generally consist of dense mixtures of sand, silty sand, and gravelly sand. Cobbles and boulders are also expected to be present. Gradation testing performed on select alluvial soils specific to our infiltration study are presented in Appendix B. Portions of the alluvial soils at the site, after removal of oversize boulders, cobbles, and a portion of the coarse gravel, would be considered suitable for use as aggregate in the proposed soil cement project. The silts or any clayey soils should be excluded for use as aggregate. Soils used in the soil cement should not contain particles larger than 3 inches in size. Silt or clay lumps should be broken down to less than ½-inch in size. The soil aggregate should be free of organic material, or other deleterious or decomposable materials, and screening may be required prior to use as soil cement material.

The amount of portland cement required in the soil cement should be sufficient to achieve a seven-day compressive strength of at least 750 pounds per square inch (psi). The soil cement test samples should be compacted to about 95 percent of the maximum dry density for moisture-density relations for soil cement mixtures, as determined using ASTM Test Method D558, modified to use ASTM D1557 compaction effort, or as specified by the soil cement design engineer. For estimating purposes, a cement content by weight of 8 to 10 percent is suggested.

To determine the actual required cement content, the granular soils that are to be used in the soil cement bank protection should be stockpiled. Representative samples of stockpile material should be mixed with varying amounts of cement, molded into test specimens, cured for different time intervals, and then tested to determine the unconfined compressive strength. Based on the results of compression testing on the molded specimens, the actual cement content to be used during construction can be determined.

SOIL CEMENT MIXING

The soil cement material to be used in production should be mixed in an on-site plant. Once mixed, the soil cement material should be placed and compaction started within 30 minutes of mixing. During adverse conditions, such as high temperatures or wind, which promote rapid drying, the allowable time between mixing and compaction may need to be reduced. The moisture content of the soil cement mixture at the start of compaction should be within 2 percent of the optimum moisture content.

COMPACTION OF SOIL CEMENT

The soil cement for the bank protection should be placed in 8-inch-thick lifts and compacted to at least 95 percent of the maximum dry density obtainable as determined using ASTM Test Method D558, modified to use ASTM D1557 compaction effort, or as specified by the soil cement design engineer. Compaction of a soil cement layer should be completed within 30 minutes of placement of the mixture. Layers of soil cement over which subsequent layers are to be placed should be kept moist until the subsequent layers are in place or for a period of at least seven days.

Exposed and potentially exposed faces of the soil cement should be finished smooth within two hours of the end of compaction or three hours of the addition of water to the soil cement mixture, whichever is less.

CURING

The finished faces of the bank protection should be kept moist for a period of at least seven days after finishing.

OBSERVATION AND TESTING

The batching and placement of the soil cement should be performed under the observation of the Geotechnical Consultant, who should perform testing for sieve analyses, sand equivalence, compaction, unconfined compression, and moisture-density relationships on a periodic basis.

SEISMIC DESIGN PARAMETERS

As with virtually all property in southern California, the site may be subjected to strong ground shaking during earthquakes on nearby or distant faults and the improvements should be designed to resist such shaking in accordance with current codes.

The following coefficients and factors apply to seismic force design of structures at the site. The parameters were determined using the American Society of Civil Engineers (ASCE) 7 Hazard Tool Online website. The following parameters below are based on the Design Code Reference Document (DCRD) ASCE 7-16 and a Risk Category of III. We defer to the project Structural Engineer to determine the appropriate DCRD and Risk Category to be used for the subject development; we can provide additional parameters, based on an alternate DCRD or Risk Category, upon request and authorization. Since S1 is greater than 0.2, "not applicable" was reported for SM1 and SD1; it will be necessary for the Project Structural Engineer to determine Cs (Seismic Response Coefficient), with the exception for Site Class D, presented in Section 11.4.8 of ASCE 7-16.

Latitude	34.41033
Longitude	-118.47252
Site Class	D
S_S	2.273
S_1	0.821
S_{MS}	2.273
S_{M1}	n/a

S_{DS}	1.516
S_{D1}	n/a
PGA_M	1.056

LIQUEFACTION

GENERAL

Liquefaction may occur when saturated, loose to medium dense, cohesionless soils are densified by ground vibrations. The densification results in increased pore water pressures if the soils are not sufficiently permeable to dissipate these pressures during and immediately following an earthquake. When the pore water pressure is equal to or exceeds the overburden pressure, liquefaction of the affected soil layers occurs. For liquefaction to occur, three conditions are required:

- ground shaking of sufficient magnitude and duration;
- a groundwater level at or above the level of the susceptible soils during the ground shaking; and
- soils that are susceptible to liquefaction.

Ground settlement may occur during seismic shaking of an area. The settlement can be caused by liquefaction of loose granular soils, consolidation of soft, but not necessarily liquefiable, soils, and dry settlement of soils above the water table.

The Seismic Hazard Zone Map for the Mint Canyon Quadrangle, released March 25, 1999, indicates that the subject site is classified as being potentially susceptible to liquefaction. There are not currently any proposed structures (habitable or otherwise) as part of the development of this portion of this site. If habitable structures are proposed in the future, it is recommended that a liquefaction evaluation be performed.

RECOMMENDATIONS

GENERAL

The following general recommendations are provided to support construction of the storm water treatment infiltration basin and other minor site improvements. It is anticipated that the minor improvements will be limited to pavements, hardscapes, and foundations for minor structures such as retaining walls and/or the diversion structure.

All design and grading work at the subject site should be conducted in accordance with the recommendations of this report and the requirements of the Los Angeles County Building Code (CBC) as amended by the City of Santa Clarita Building Code.

INFILTRATION BASINS

It is anticipated that grading for the storm water treatment basin will consist of excavation into native soils to depths of approximately 20-feet below existing grades. The design and construction of the basin should take into consideration the following:

- all infiltration should be within the naturally deposited soils or formational deposits; infiltration into compacted fill should be avoided;
- any areas within the exposed basin subgrade that may have become disturbed during grading should be excavated back down to undisturbed soils and replaced with gravel;
- the infiltration basins should be located at least 20 feet (measured horizontally) providing a maximum 1:1 gradient (measured horizontal to vertical) from the bottom of any existing or future foundations;
- the infiltration basins should be set back at least 20 feet (measured horizontally) providing a maximum 1:1 gradient (measured horizontal to vertical) from the face of any descending natural slope;

- the infiltration basins should be set back at least 20 feet (measured horizontally) providing a maximum 1:1 gradient (measured horizontal to vertical) from the face of any existing or future descending graded slope; and

- the infiltration basin should maintain a setback of at least 20 feet from adjacent property or easement lines.

MINOR SITE IMPROVEMENTS

It is anticipated that grading will be required for construction of minor site improvements. The grading should include the removal and recompaction of the near surface soils below pavements, hardscapes, and foundations. The removals will consist of native and existing artificial fill soils, as well as any additional soils that may become disturbed during site demolition and construction.

Proposed foundations, pavements, and major slab areas should be underlain by at least 3 feet of compacted fill soil. If it is required to make cuts to establish the final grades for the improvements, the final cut grade should be over-excavated to allow for the placement of at least 3 feet of compacted fill soil below the proposed soil subgrade. It will not be required to over-excavate the existing grade in areas where it is required to place at least 3 feet of compacted fill to establish final grade for the improvements. However, any artificial fill or disturbed soils exposed at existing grade will require additional over-excavation. The removal bottoms will require processing prior to placement of compacted fill as discussed below.

It is anticipated that the foundation for the proposed diversion structure will be located approximately 10-feet below the existing Metrolink Parking Lot grades and will be founded in existing fill soils. The bottom of diversion structure foundation excavations will require processing prior to placement of reinforcing steel and/or concrete, as discussed below.

The remaining areas of the site where minor improvements are proposed, such as concrete sidewalks or walking trails, should be removed at least 12 inches below existing grade; the resulting removal bottom should be "proof-rolled" with relatively heavy grading equipment to determine if the exposed soils are satisfactory or if additional removals will be required. The proof-rolling of the exposed soils should be performed under the observation of our field representative. The removal bottoms will then require processing prior to placement of compacted fill, as discussed below.

The exposed removal bottoms and diversion structure foundation bottoms should be processed prior to placement of compacted fill or reinforcing steel and/or concrete. Processing of soil should consist of scarifying the upper 6 to 12 inches of the exposed grade, adjusting the moisture content of the scarified soil to approximately two percent above optimum moisture content, and then compacting the exposed soil to at least 90 percent of the maximum dry density of the soil. The bottoms of areas to be filled should be observed and approved by a representative of the Geotechnical Engineer of Record prior to fill placement. It may be required to have a representative from the governing agency observe bottom areas prior to fill placement; the contractor selected for the project should be familiar with the requirements for regulatory inspections.

Fill should be placed in layers not exceeding 12 inches in loose thickness, adjusted to approximate optimum moisture content, and compacted to at least 90 percent of the maximum dry density of the soil as determined by the current ASTM Soil Compaction Method D1557. Organic and decomposable material should be excluded from the fill, as should solid material exceeding 8 inches in maximum dimension. Fill soils should be placed and compacted under the observation and testing of a representative of the Geotechnical Engineer of Record.

If it is required to import soil for use as compacted fill, the imported soil should be relatively non-expansive and similar to the on-site soil. A 40-pound sample of proposed import soil should be submitted to the Geotechnical Engineer of Record at least 48 hours prior to importing to the job site to determine if the soil would be acceptable for use on the project.

GENERAL GRADING REQUIREMENTS

1. All fills, unless otherwise specifically designed, shall be compacted to at least 90 percent of the maximum dry unit weight as determined by the ASTM D1557 Method of Soil Compaction.

2. No fill shall be placed until the area to receive the fill has been adequately prepared and subsequently approved by the Geotechnical Engineer of Record or his representative.

3. Fill soils should be kept free of debris and organic material.

4. Rocks or hard fragments larger than 8 inches may not be placed in the fill without approval of the Geotechnical Engineer of Record or his representative, and in a manner specified for each occurrence.

5. The fill material shall be placed in layers which, when compacted, shall not exceed 8 inches per layer. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to ensure uniformity of material and moisture.

6. When moisture content of the fill material is too low to obtain adequate compaction, water shall be added and thoroughly dispersed until the soil is approximately two percent over optimum moisture content.

7. When the moisture content of the fill material is too high to obtain adequate compaction, the fill material shall be aerated until the soil is approximately two percent over optimum moisture content.

8. Fill and cut slopes should not be constructed at gradients steeper than 2:1 (horizontal:vertical).

TEMPORARY EXCAVATIONS

Temporary excavations may be cut vertically up to heights of 4 feet. Excavations that exceed 4 feet should be sloped at a gradient not steeper than 1:1 (horizontal to vertical) to a maximum height not to exceed 14-feet. Excavations greater than 14-feet in height should be sloped at a gradient not steeper than 1.5:1 (horizontal to vertical). By temporary, we mean a period not exceeding 45-days. Excavations not complying with these requirements should be shored. It is strongly recommended that excavations formed in sands and/or dry soils be kept moist, but not saturated, at all times. Soil stockpiles or other heavy loads, including heavy equipment, should not be allowed along the top of a temporary excavation. All regulations of state or federal OSHA should be followed.

If excavations are made during the rainy season, care should be taken to protect slopes from erosion; the rainy season is normally from November through April. Measures to mitigate erosion, such as the installation of berms, plastic sheeting, or other devices, may be warranted to prevent surface water from flowing over or collecting at the tops of excavations.

FOUNDATIONS

General: The foundations for minor structures, such as diversion structures and/or retaining walls, may be supported on continuous or individual spread footings established entirely in native soils or properly compacted fill soils. Our firm should review and approve the project Foundation Plans prior to the initiation of construction.

Building setbacks for structures located adjacent to either ascending or descending slopes should be in accordance with the standards set forth in Section 1808.7 and Figure No. 1808.7.1 of the Los Angeles County Building Code and latest applicable amendments and supplements (CBC). Footings should not be constructed within one-third the height of the slope, with a maximum setback distance of 40 feet.

Footings located near the toe of a slope should not be constructed any closer to the slope than one-half the height of the slope, with a maximum setback distance of 15 feet and a minimum setback distance of H/2, where H is the wall height in feet.

All foundation excavations should be observed and approved by a representative from our firm prior to placement of reinforcing steel. Foundations should be deepened, where necessary, to prevent surcharge loads from being imposed on adjacent foundations or utilities. Observation of foundation excavations may also be required by the appropriate reviewing governmental agencies. The contractor should be familiar with the requirements of the governing reviewing agencies.

Bearing Capacity: It is assumed that proposed foundations for minor non-habitable structures will be at-grade and lightly loaded. The foundations may be designed using a bearing value of 1,500 pounds per square foot (psf). The recommended bearing value is a net value and the weight of concrete in the footings may be taken as 50 pounds per cubic foot (pcf). The weight of soil backfill may be neglected when determining the downward loads from the footings. A one-third increase in the bearing value may be used when considering wind or seismic loads.

Lateral Resistance: Lateral loads may be resisted by soil friction and by the passive resistance of the soils. A coefficient of friction of 0.4, applied to the dead loads, may be used for footings and floor slabs supported on the compacted fill soil. The passive resistance of properly compacted fill soils may be assumed to be equal to the pressure developed by a fluid with a density of 250 pcf. The frictional resistance and the passive resistance of the soils may be combined, without reduction, in determining the total lateral resistance.

Settlement: Provided that the minor structures do not exceed the previously assumed structural loads and the foundations are founded in compacted fill soils as recommended, the total settlement attributed to static and seismic conditions is estimated to be about 2.0 inches. The maximum differential settlement, when considering static and seismic conditions, is estimated to be about 1.0 inch within a horizontal distance of 30 feet.

Foundation Observations: To verify the presence of satisfactory soils at foundation design elevations, the excavations should be observed by the Geotechnical Consultant of Record. Excavations should be deepened, as necessary, to extend into satisfactory soils. Where the foundation excavations are deeper than 4 feet, the sides of the excavations should be sloped back at a gradient of 1:1 or be shored for safety.

Inspection of foundation excavations may also be required by the appropriate reviewing governmental agencies. The contractor should be familiar with the inspection requirements of the reviewing agencies.

RETAINING WALLS

General: This section of the report has been prepared to provide seismic and static retaining wall design recommendations for retaining walls that are less than 12 feet in height. The recommendations of the referenced reports remain applicable except where specifically modified in this report.

Foundations: A bearing value of 1,500 pounds per square foot (psf) may be used in the design of foundations that are founded at least 12 inches below lowest adjacent final grade. The bearing value can be increased by one-third when considering seismic and wind forces. The bearing material should consist of compacted fill soil.

Building setbacks for structures located adjacent to either ascending or descending slopes should be in accordance with the standards set forth in the CBC. Those setback requirements indicate that a footing located at the top of a slope should not be constructed within one-third the height of the slope, with a maximum setback distance of 40 feet. Footings located near the toe of a slope should not be constructed any closer to the slope than one-half the height of the slope, with a maximum setback distance of 15 feet and a minimum setback distance of 3 feet.

All foundation excavations should be observed and approved by a representative from our firm prior to placement of reinforcing steel. Foundations should be deepened, where necessary, to prevent surcharge loads from being imposed on adjacent foundations or utilities. Observation of foundation excavations may also be required by the appropriate reviewing governmental agencies. The contractor should be familiar with the requirements of the governing reviewing agencies.

Lateral Design: Lateral restraint at the bases of footings or slabs may be assumed to be the product of the dead load and a coefficient of friction of 0.4. Passive pressure on the faces of footings may also be used to resist lateral forces. A passive pressure of zero at the surface of finished grade, increasing at the rate of 350 psf per foot of depth, to a maximum value of 2,500 psf, may be used at this site. The passive pressure and friction may be combined without reduction when evaluating lateral resistance.

Lateral Earth Pressure: Cantilevered retaining walls separate and independent of buildings, where the surface of the backfill is level and the retained height of soils is less than 12 feet, may be designed assuming that drained, non-expansive soils will exert a lateral pressure equal to that developed by a fluid with a density of 30 pounds per cubic foot (pcf). The indicated pressure assumes that a lateral deflection of up to about one percent of the wall height is acceptable at the top of the wall. If it is desired to decrease the amount of potential wall deflection, a greater lateral pressure could be used in the wall design.

Where the surface of the backfill is inclined at 2:1, it may be assumed that drained soils will exert a lateral pressure equal to that developed by a fluid with a density of 45 pcf.

For the design of a rigid wall where rotation and lateral movement are not acceptable, as in the case of buildings and the proposed diversion structure, it may be assumed that drained, non-expansive soils will exert a rectangular lateral pressure with a maximum pressure equal to 22H psf, where "H" is the wall height in feet. The pressure value and distribution may vary significantly when considering wall rigidity and restraining conditions. The structural characteristics of the wall are referred to the Project Structural Engineer. If requested, we can provide additional geotechnical design parameters for specific restrained conditions.

In addition to the recommended earth pressure, walls should be designed to resist any lateral surcharges due to nearby buildings, storage, or traffic loads. A drainage system should be provided behind the walls to reduce the potential for development of hydrostatic pressure. If a drainage system is not installed, walls should be designed to resist an additional hydrostatic pressure equal to that developed by a fluid with a density of 55 pcf for the full height of the wall.

Seismic Lateral Earth Pressure: The preceding recommended values indicate earth pressures for conventional static loading conditions. Ground shaking associated with earthquakes may cause additional pressure on walls. In addition to the previously mentioned lateral earth pressures, it is recommended that all rigid (building) walls of any height, and cantilevered retaining walls greater than 6 feet in height, be designed to support an additional seismic earth pressure equal to an inverted equivalent fluid pressure of 29 pcf.

Backfill: Backfill placed behind retaining walls should be compacted to a minimum of 90 percent of the maximum dry density, as determined by the current ASTM D1557 method of compaction. When placing backfill, walls should be braced. Heavy compaction equipment should not be used any closer to the back of the wall than the height of the wall. Soils that have an Expansion Index potential in excess of 50 should not be utilized for backfill behind retaining walls. The backs of retaining walls should be waterproofed. If retaining walls are not waterproofed, adverse impacts related to moisture-related distress should be anticipated.

Density of Backfill: When designing retaining walls to resist overturning, it can be assumed that compacted, on-site soils will have a density of 125 pcf.

Wall Drainage: A drainage system should be provided behind retaining walls, or the walls should be designed to resist hydrostatic pressures. Retaining wall backfill may be drained utilizing a perforated pipe. The perforated pipe should be at least 4 inches in diameter and be placed at the base of the wall, with the perforations pointed down. The pipe should be sloped to provide positive drainage, but in no instance shall the pipe be elevated more than 2 feet above the bottom of the wall. The pipe should be surrounded by at least 6 inches of uniform-sized gravel and be permitted to outlet onto a surface that would not be subject to erosion, or the drain should be connected to a suitable outlet device. The gravel should be separated from the surrounding soils by a filter fabric, such as Mirafi 140N or equivalent, wrapped around the gravel ("burrito-wrapped"). Alternatively, the filter fabric and gravel may be omitted when using a continuous slotted pipe and sand that conforms to LACDPW "Graybook," F-1 Designated Filter Material.

Drainage panels, such as Miradrain or equivalent, or a 6- to 12-inch-wide gravel chimney drain, should be installed behind retaining walls that are greater than 3 feet in height. The top of the drainage panels or chimney drain should be capped with 18 to 24 inches of compacted, on-site soil; the thickness of the cap should be increased to provide a minimum of 3 feet of compacted fill soils under any footing within the area of the backfill, where appropriate. The intent of installing the drainage panels or chimney drain would be to reduce the potential for build-up of water directly behind the walls. Excessive build-up of water could result in wall failure.

The installed drainage system should be observed by the Geotechnical Consultant prior to backfilling the system. Observation of the drainage system may also be required by the reviewing governmental agencies prior to backfilling.

PAVEMENT DESIGN

Bulk samples of onsite soils were obtained near existing grades to perform laboratory R-value tests for pavement section design. The following preliminary pavement section recommendations are based on the test results and have been prepared assuming that the soils at the subject site have an R-value of at least 30. When the proposed fine grading operations are nearing completion, samples of the on-site soil should be obtained from near final grade, in the proposed pavement areas, to perform additional R-value tests. The final pavement section recommendations would be dependent upon the results of those R-value tests and could vary from those presented below.

Traffic Index	Asphalt Thickness (Inches)	Base Course (CAB) Thickness (Inches)	Base Course (CMB) Thickness (Inches)
4	3	6	8
6	4	8	10
8	5	11	13
10	7	14	16

Base course material should consist of crushed aggregate base (CAB), as defined by Section 200-2.2 of the Standard Specifications for Public Works Construction (Greenbook). If crushed miscellaneous base (CMB) is used, it should meet the specifications outlined in Section 200-2.4 of the Greenbook. Base course should be compacted to at least 95 percent of the maximum dry density of that material.

Base course material should be purchased from a supplier who will certify that the base course will meet or exceed the specifications as indicated in the Greenbook. Sieve analysis and sand equivalency tests would be performed, upon request, on material delivered to the site which appears suspect. Additional tests could be performed, upon request, to determine if the material is in compliance with the remaining specifications presented in the Greenbook.

The pavement section recommendations presented above are based upon assumed Traffic Index values. R. T. Frankian & Associates does not take responsibility for the numerical determination of the Traffic Index values or the areas where they apply within the site. We would be pleased to provide pavement section recommendations for alternative Traffic Index values upon request.

To potentially increase the pavement life, concrete curbs and gutters should be deepened to extend below the base course material and be seated in the compacted fill. The intent of deepening the curbs and gutters is to form a cut-off wall to reduce the amount of water flow through the base course material from adjacent landscaped areas. Subgrade soils which become saturated as a result of water flowing through base course material can reduce the life of the pavement. The curbs should be deepened to an elevation at least 6 inches below the base of the proposed base course section. The curb subgrade should be thoroughly moistened prior to casting concrete.

OBSERVATION/TESTING SERVICES

This report has been prepared assuming that R. T. Frankian & Associates will perform all geotechnical field observations and testing. If the recommendations presented in this report are utilized and observation/testing of the geotechnical work is performed by others, the party performing the observations/testing must review this report and assume responsibility for the recommendations presented herein, or provide an additional report. That party would then assume the title "Geotechnical Engineer of Record" for the project and respond to any design and construction-related issues that may arise.

A representative of the Geotechnical Engineer of Record should be present to observe grading and backfill operations as well as foundation excavations for the project. A report presenting the results of these observations and related testing should be issued upon completion of the work.

LIMITATIONS

Our professional services have been performed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable geotechnical engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report. This report has been prepared for Chiquita Canyon Landfill and their design consultants, to be used solely for planning and design of the Landfill Entrance Facility, and associated grading. The report has not been prepared for use by other parties and may not contain sufficient information for purposes of other parties or other uses.

-oOo-

We appreciate the opportunity to be of service. Please call if you have questions or would like to discuss this report in more detail. The following are attached and complete this report.

- References
- Geotechnical Map – Figure 1
- Historically Highest Ground Water Contour Map - Figure 2
- Water Well Location Map – Figure 3
- Appendix A – Explorations
- Appendix B – Laboratory Tests
- Appendix C – Infiltration Test Data and Calculations
- Appendix D – Water Well Records
- Appendix E – Geosyntec Technical Memorandum

Respectfully submitted,

R. T. FRANKIAN & ASSOCIATES

REGISTERED PROFESSIONAL ENGINEER
ALAN W. RASPLICKA
No. GE 2558
GEOTECHNICAL
STATE OF CALIFORNIA

by: Scott David Rudd
Project Supervisor

and: Alan W. Rasplicka
Principal Geotechnical Engineer

PROFESSIONAL GEOLOGIST
12/2022
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PDF Distribution via Email:
- PACE - Attn.: Mr. Duong Do
- City of Santa Clarita – Attn.: Mr. Dan Duncan

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GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

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Dibblee, T. W., Jr., 1996, "Geologic Map of the Mint Canyon Quadrangle, Los Angeles County, California," Dibblee Geological Foundation Map #DF-57.

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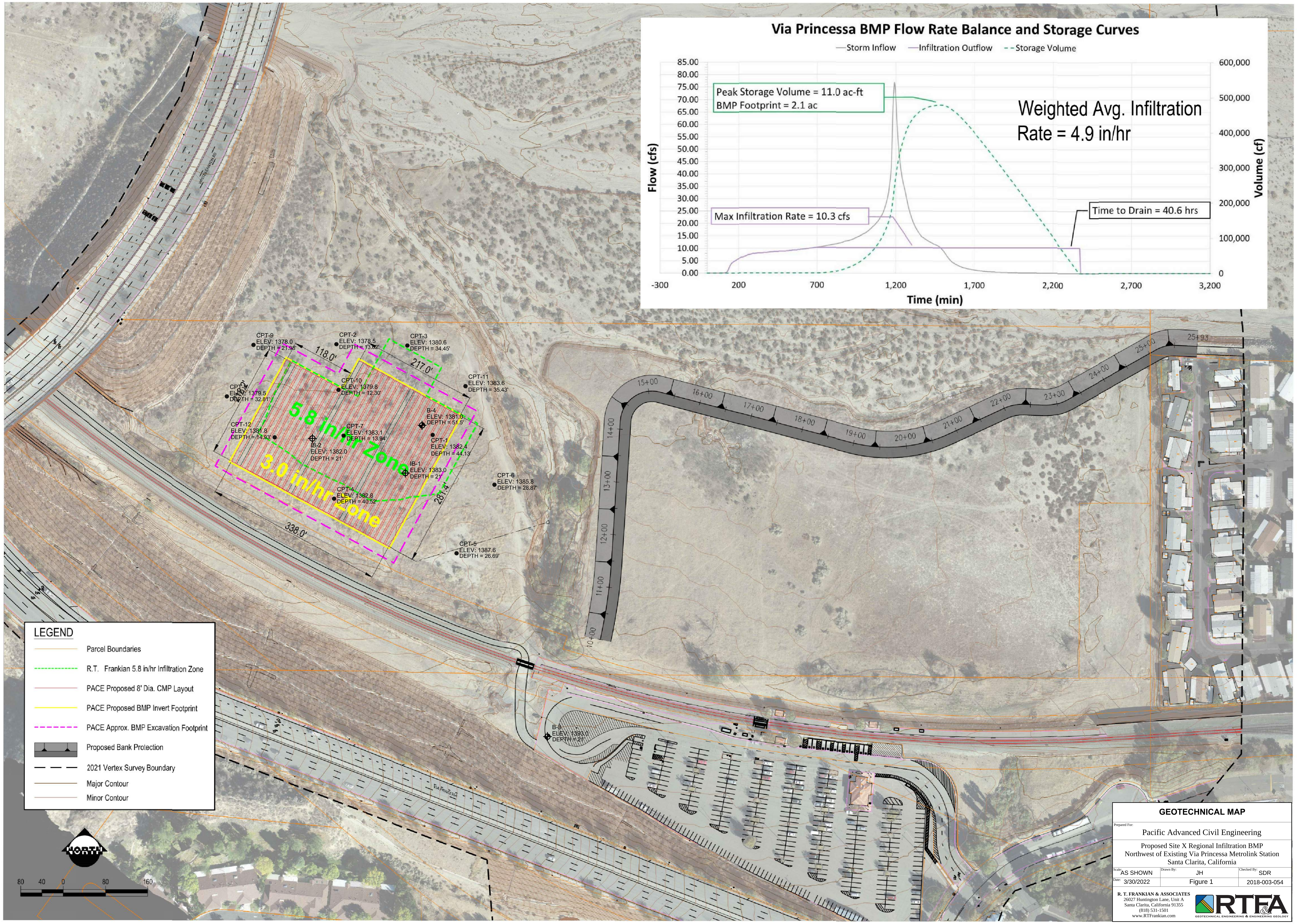

PRELIMINARY BMP LAYOUT

VIA PRINCESSA PARK REGIONAL INFILTRATION BMP SANTA CLARITA CA

PREPARED BY PACE
PROJECT ENGINEER DUONG DO
SCALE 1" = 80'
DATE 02-16-2022
DRAWN C.T.
DESIGNED C.T.
CHECKED D.D.

PACE Advanced Water Engineering
17520 Newhope Street, Suite 200 | Fountain Valley, CA 92708
P: (714) 481-7300 | www.pacewater.com

SHEET 2

JOB NO. B894

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Pacific Advanced Civil Engineering
March 30, 2022
2018-003-054

FIGURE 2
HISTORICALLY HIGHEST GROUND WATER CONTOUR MAP

Seismic Hazard Zone Report for the Mint Canyon 7.5-Minute Quadrangle

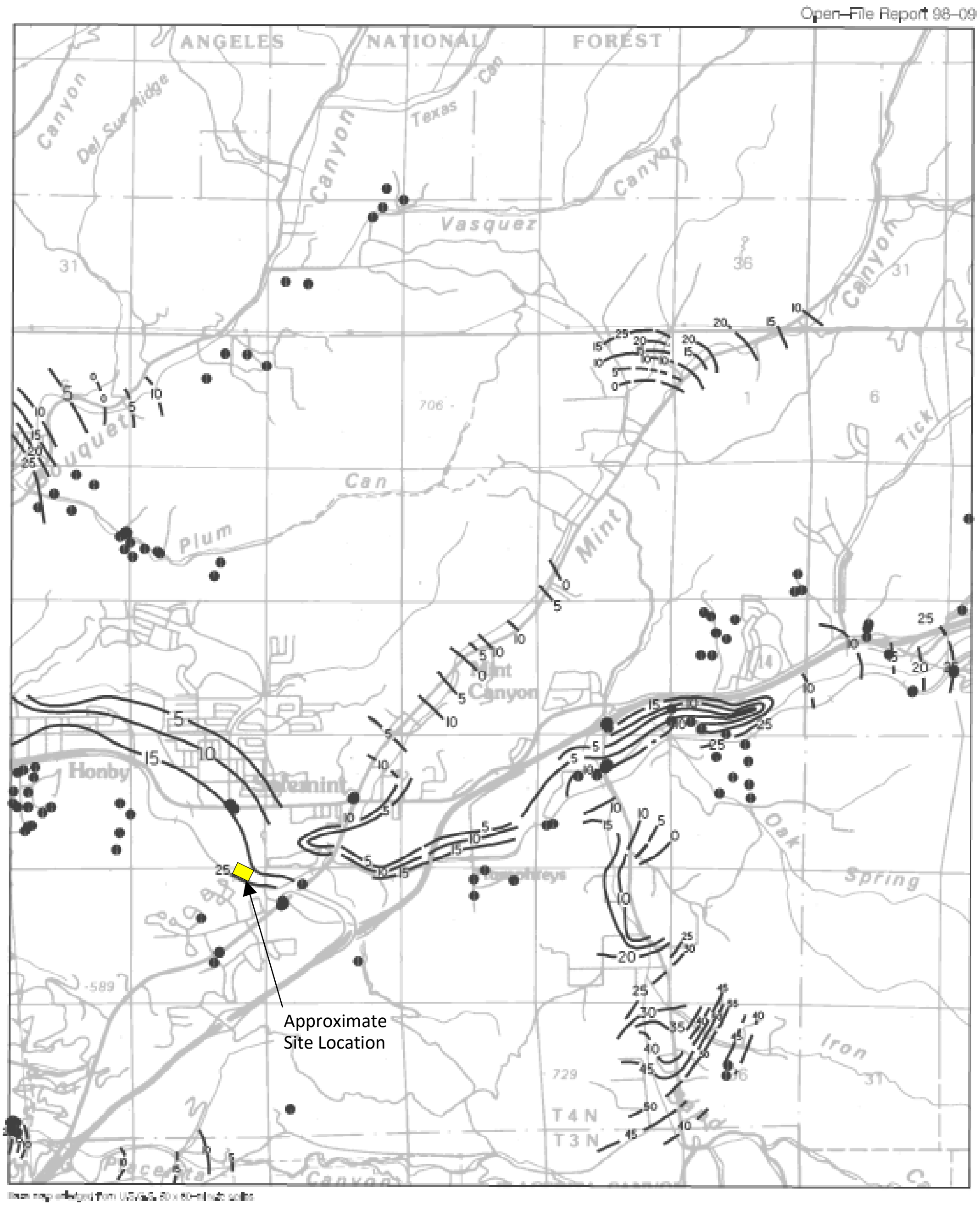

Plate 1.2 Historically Highest Ground Water Contours and Borehole Log Data Locations, Mint Canyon Quadrangle.

● Borehole Site

30 Depth to ground water in feet

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Department of Public Works
dpw.lacounty.gov

Search By: Address/Intersection ▼ Search Buffer: None ▼ Active Wells Inactive Wells

Water Well Location Map		
Prepared For: PACE		
Proposed Site X Regional Infiltration BMP Northwest of Existing Via Princessa Metrolink Station Santa Clarita, California		
Scale: As Shown	Drawn By: JH	Checked By: JAF
Date: 03/30/22	Figure 3	2018-003-054

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HYDROLOGY ANALYSIS

PACE - FEBRUARY 2022

Watershed Parameters

WS ID	Acres	L	LCA	USELEV	DSELEV
1	17.4	1485.3	612.2	1423	1398
2	21.6	2000.1	1676.3	1465	1400
3	20.9	1949.2	592.3	1484	1406
4	14.6	1181.0	768.5	1537	1484
6	14.9	1619.7	602.8	1480	1420
7	11.7	884.9	445.6	1474	1422
8	38.6	2718.8	1298.8	1661	1474
10	15.1	1448.4	523.9	1518	1450
11	13.2	1132.9	608.5	1473	1433
12	16.0	2073.9	1019.9	1740	1552
13	6.2	572.6	445.2	1487	1468
14	29.0	1858.5	686.5	1741	1586
15	14.5	1568.0	1053.7	1535	1441
16	18.1	1317.7	594.5	1609	1490
18	38.2	2398.8	1135.2	1638	1460
19	15.3	2196.2	1137.3	1692	1501
20	37.3	1528.1	423.2	1766	1572
21	19.7	1450.9	207.8	1691	1604
22	37.7	3473.9	1938.1	1722	1452
23	32.4	2162.6	1261.0	1735	1512
24	17.1	1387.7	819.6	1766	1742
26	20.4	1280.1	776.1	1744	1694
27	9.2	1059.6	629.6	1724	1572
29	17.2	1156.5	513.4	1397	1374
30	16.4	1022.7	654.4	1390	1380
31	38.4	2901.6	1069.5	1558	1392
33	35.3	2010.5	1187.6	1602	1448
34	17.3	1042.5	661.8	1721	1576
36	16.2	1441.0	203.2	1601	1495
37	18.7	1322.2	732.9	1576	1534
38	9.5	944.3	506.3	1623	1504
39	20.4	1568.6	337.8	1598	1512
40	13.2	1086.3	566.7	1516	1471
41	21.5	1023.2	441.1	1790	1740
42	12.6	1152.4	722.9	1820	1602
43	25.2	2514.7	1304.8	1780	1540
44	14.1	963.6	494.7	1750	1622
45	36.6	2775.2	1515.8	1870	1690
47	32.7	1879.5	921.7	1836	1718
48	21.9	1087.9	602.5	1800	1750
49	21.3	2488.1	711.2	1833	1669
50	26.5	2382.2	1326.9	1760	1684
52	17.1	1347.9	527.3	1598	1509
53	13.1	1326.9	724.4	1602	1496
54	21.4	1340.8	703.3	1483	1418
57	14.6	1392.2	725.5	1526	1459
59	11.6	1439.6	987.3	1604	1541
60	8.2	909.0	558.6	1586	1552
63	7.8	871.7	629.1	1474	1450
64	9.9	1121.6	550.1	1488	1454

Land Use Soils

ID	Acres	Hydrologic Soil Group	Land_Use	Module Equivalent Land Use	Impervious (Percent)	Impervious Area (ac)	A	B	C	D	CN
1	1.9	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
3	0.3	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
3	0.4	D	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	84
4	3.4	D	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	84
6	0.4	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
7	1.1	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
8	3.8	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
8	1.8	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
11	1.5	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
12	3.8	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
12	8.0	C	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	79
14	0.7	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
14	0.1	C	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	79
14	3.1	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
14	1.8	C	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	79
16	4.6	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
18	4.5	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
18	5.4	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
19	0.1	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
19	0.0	C	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	79
20	15.0	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
20	6.6	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
20	6.5	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
21	8.9	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
22	0.8	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
22	1.6	C	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	79
22	0.9	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
22	1.8	C	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	79
23	6.2	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
23	3.8	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
24	16.4	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
26	13.3	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
27	6.3	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
27	0.9	C	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	79
29	13.9	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
30	16.2	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
31	4.7	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
31	9.0	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
33	5.3	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
33	1.3	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
34	16.7	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
36	3.5	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
37	2.9	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
38	2.6	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
39	2.3	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
41	5.5	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
42	12.3	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
43	5.6	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
43	11.2	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
44	9.9	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
45	2.2	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
45	12.3	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
47	9.5	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
47	5.6	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
48	21.7	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
49	1.5	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
50	0.8	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
50	0.3	C	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	79
50	9.0	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
52	3.6	D	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	84
53	0.7	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
53	3.4	D	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	84
54	5.0	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
57	0.0	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
59	1.5	B	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	69
60	0.1	C	Brush, Brush Weed Grass Mixture, Good	Open Space	0.0	0.0	49	69	79	84	79
						0.0	ac impervious		0.0%	of tot impervious	
1	4.4	B	Commercial and Business	Commercial	90.0	4.0	89	92	94	95	92
3	5.7	B	Commercial and Business	Commercial	90.0	5.2	89	92	94	95	92
3	8.9	D	Commercial and Business	Commercial	90.0	8.0	89	92	94	95	95
4	0.1	D	Commercial and Business	Commercial	90.0	0.1	89	92	94	95	95
7	4.5	B	Commercial and Business	Commercial	90.0	4.1	89	92	94	95	92
7	0.3	D	Commercial and Business	Commercial	90.0	0.2	89	92	94	95	95
10	3.5	B	Commercial and Business	Commercial	90.0	3.2	89	92	94	95	92
10	0.6	D	Commercial and Business	Commercial	90.0	0.6	89	92	94	95	95
11	2.1	B	Commercial and Business	Commercial	90.0	1.9	89	92	94	95	92
15	0.1	B	Commercial and Business	Commercial	90.0	0.1	89	92	94	95	92
18	0.5	B	Commercial and Business	Commercial	90.0	0.5	89	92	94	95	92
19	1.9	B	Commercial and Business	Commercial	90.0	1.7	89	92	94	95	92
23	2.7	B	Commercial and Business	Commercial	90.0	2.4	89	92	94	95	92
45	0.1	B	Commercial and Business	Commercial	90.0	0.1	89	92	94	95	92
57	6.7	B	Commercial and Business	Commercial	90.0	6.0	89	92	94	95	92
64	2.4	B	Commercial and Business	Commercial	90.0	2.2	89	92	94	95	92
						40.1	ac impervious		11.02%	of tot impervious	
12	0.9	C	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	79
14	5.3	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
14	7.5	C	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	79
14	0.8	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
14	1.9	C	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	79

ID	Acres	Hydrologic Soil Group	Land_Use	Module Equivalent Land Use	Impervious (Percent)	Impervious Area (ac)	A	B	C	D	CN
20	1.4	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
20	4.9	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
21	0.8	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
24	0.6	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
26	7.2	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
43	0.9	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
44	4.1	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
47	0.4	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
47	6.4	B	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	69
60	3.7	C	Newly Graded Areas	Open Space	0.0	0.0	49	69	79	84	79
1	6.2	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
2	7.2	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
3	1.0	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
8	0.7	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
8	0.3	C	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	79
8	2.9	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
11	6.8	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
12	0.0	C	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	79
18	3.0	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
29	0.0	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
31	2.5	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
31	2.2	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
33	4.5	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
36	1.7	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
36	0.2	C	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	79
37	0.0	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
38	0.9	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
39	3.0	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
39	2.3	C	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	79
54	5.6	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
57	2.4	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
60	0.0	B	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	69
60	2.4	C	Open Space, Good	Open Space	0.0	0.0	49	69	79	84	79
24	0.1	B	Open Space, Poor	Open Space	0.0	0.0	49	69	79	84	69
45	14.6	B	Open Space, Poor	Open Space	0.0	0.0	49	69	79	84	69
45	0.0	B	Open Space, Poor	Open Space	0.0	0.0	49	69	79	84	69
45	7.3	B	Open Space, Poor	Open Space	0.0	0.0	49	69	79	84	69
						0.0	**ac impervious**		**0.0%**	**of tot impervious**	
1	2.0	B	Parking Lots, Roofs, Driveways	Industrial	100	2.0	98	98	98	98	98
29	3.3	B	Parking Lots, Roofs, Driveways	Industrial	100	3.3	98	98	98	98	98
30	0.1	B	Parking Lots, Roofs, Driveways	Industrial	100	0.1	98	98	98	98	98
						5.4	**ac impervious**		**1.48%**	**of tot impervious**	
12	1.4	B	Residential 1/3 acre	Single Family Residential	30	0.4	57	72	81	86	72
14	1.0	B	Residential 1/3 acre	Single Family Residential	30	0.3	57	72	81	86	72
20	0.4	B	Residential 1/3 acre	Single Family Residential	30	0.1	57	72	81	86	72
						0.8	**ac impervious**		**0.22%**	**of tot impervious**	
1	2.9	B	Residential 1/8 acre	Multi-family residential	65	1.9	77	85	90	92	85
1	0.0	D	Residential 1/8 acre	Multi-family residential	65	0.0	77	85	90	92	92
2	14.4	B	Residential 1/8 acre	Multi-family residential	65	9.4	77	85	90	92	85
3	1.2	B	Residential 1/8 acre	Multi-family residential	65	0.8	77	85	90	92	85
3	2.8	D	Residential 1/8 acre	Multi-family residential	65	1.9	77	85	90	92	92
4	0.3	B	Residential 1/8 acre	Multi-family residential	65	0.2	77	85	90	92	85
4	10.8	D	Residential 1/8 acre	Multi-family residential	65	7.0	77	85	90	92	92
6	14.5	B	Residential 1/8 acre	Multi-family residential	65	9.4	77	85	90	92	85
7	5.8	B	Residential 1/8 acre	Multi-family residential	65	3.8	77	85	90	92	85
7	0.0	D	Residential 1/8 acre	Multi-family residential	65	0.0	77	85	90	92	92
8	15.9	B	Residential 1/8 acre	Multi-family residential	65	10.4	77	85	90	92	85
8	0.7	C	Residential 1/8 acre	Multi-family residential	65	0.4	77	85	90	92	90
8	12.2	B	Residential 1/8 acre	Multi-family residential	65	8.0	77	85	90	92	85
8	0.2	C	Residential 1/8 acre	Multi-family residential	65	0.2	77	85	90	92	90
10	7.6	B	Residential 1/8 acre	Multi-family residential	65	4.9	77	85	90	92	85
10	3.3	D	Residential 1/8 acre	Multi-family residential	65	2.2	77	85	90	92	92
11	2.8	B	Residential 1/8 acre	Multi-family residential	65	1.8	77	85	90	92	85
12	0.5	B	Residential 1/8 acre	Multi-family residential	65	0.3	77	85	90	92	85
12	1.5	C	Residential 1/8 acre	Multi-family residential	65	1.0	77	85	90	92	90
13	5.9	B	Residential 1/8 acre	Multi-family residential	65	3.9	77	85	90	92	85
13	0.2	C	Residential 1/8 acre	Multi-family residential	65	0.1	77	85	90	92	90
14	2.7	B	Residential 1/8 acre	Multi-family residential	65	1.8	77	85	90	92	85
14	4.0	C	Residential 1/8 acre	Multi-family residential	65	2.6	77	85	90	92	90
15	14.4	B	Residential 1/8 acre	Multi-family residential	65	9.4	77	85	90	92	85
16	13.4	B	Residential 1/8 acre	Multi-family residential	65	8.7	77	85	90	92	85
16	0.1	C	Residential 1/8 acre	Multi-family residential	65	0.1	77	85	90	92	90
18	11.5	B	Residential 1/8 acre	Multi-family residential	65	7.4	77	85	90	92	85
18	13.3	B	Residential 1/8 acre	Multi-family residential	65	8.6	77	85	90	92	85
19	10.3	B	Residential 1/8 acre	Multi-family residential	65	6.7	77	85	90	92	85
19	2.9	C	Residential 1/8 acre	Multi-family residential	65	1.9	77	85	90	92	90
21	10.0	B	Residential 1/8 acre	Multi-family residential	65	6.5	77	85	90	92	85
22	12.0	B	Residential 1/8 acre	Multi-family residential	65	7.8	77	85	90	92	85
22	2.9	C	Residential 1/8 acre	Multi-family residential	65	1.9	77	85	90	92	90
22	4.6	B	Residential 1/8 acre	Multi-family residential	65	3.0	77	85	90	92	85
22	13.1	C	Residential 1/8 acre	Multi-family residential	65	8.5	77	85	90	92	90
23	2.1	B	Residential 1/8 acre	Multi-family residential	65	1.4	77	85	90	92	85
23	7.7	B	Residential 1/8 acre	Multi-family residential	65	5.0	77	85	90	92	85
27	1.8	B	Residential 1/8 acre	Multi-family residential	65	1.2	77	85	90	92	85
27	0.0	C	Residential 1/8 acre	Multi-family residential	65	0.0	77	85	90	92	90
31	12.7	B	Residential 1/8 acre	Multi-family residential	65	8.3	77	85	90	92	85
31	7.3	B	Residential 1/8 acre	Multi-family residential	65	4.8	77	85	90	92	85
33	12.6	B	Residential 1/8 acre	Multi-family residential	65	8.2	77	85	90	92	85
33	11.6	B	Residential 1/8 acre	Multi-family residential	65	7.5	77	85	90	92	85

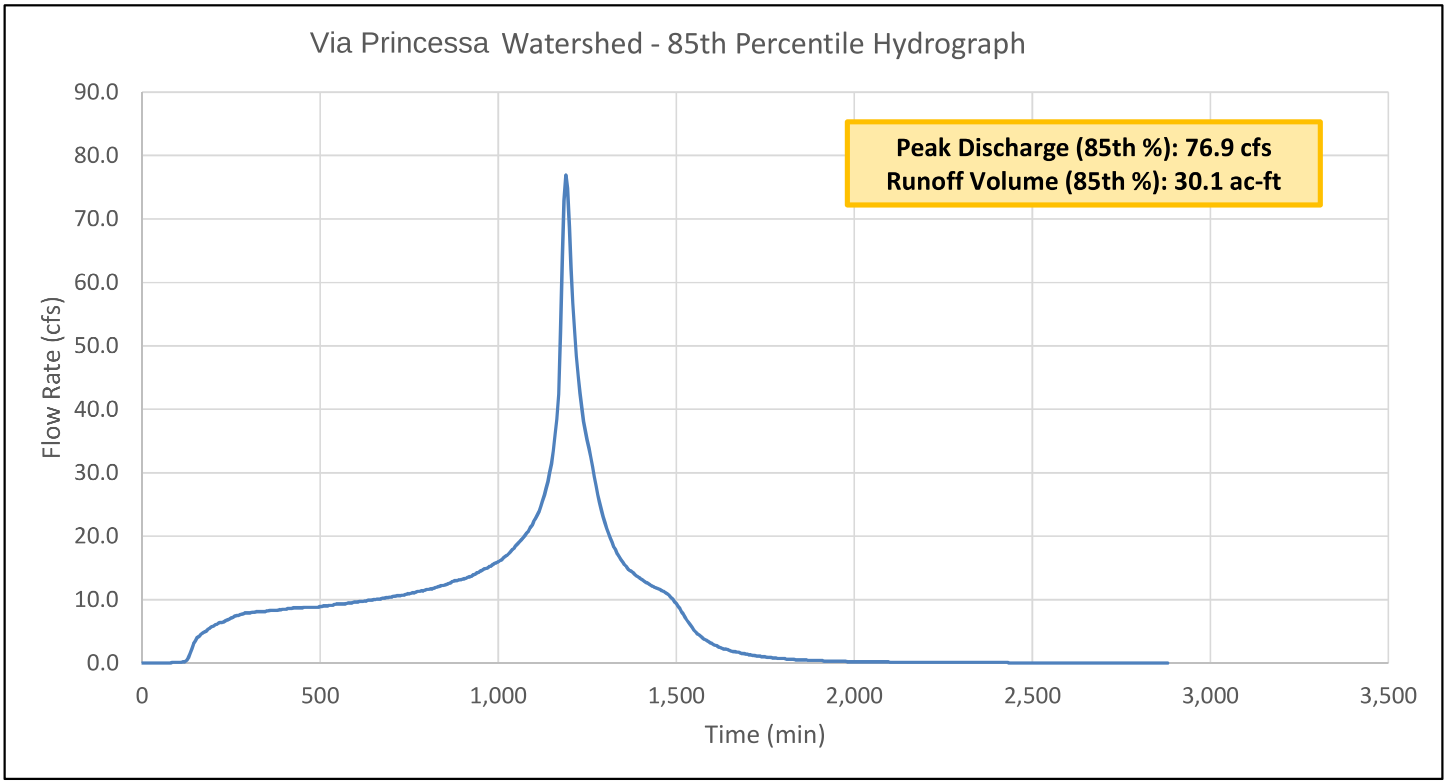
Land Use Soils

ID	Acres	Hydrologic Soil Group	Land_Use	Module Equivalent Land Use	Impervious (Percent)	Impervious Area (ac)	A	B	C	D	CN
34	0.5	B	Residential 1/8 acre	Multi-family residential	65	0.3	77	85	90	92	85
36	8.3	B	Residential 1/8 acre	Multi-family residential	65	5.4	77	85	90	92	85
36	2.6	C	Residential 1/8 acre	Multi-family residential	65	1.7	77	85	90	92	90
37	15.8	B	Residential 1/8 acre	Multi-family residential	65	10.3	77	85	90	92	85
38	6.0	B	Residential 1/8 acre	Multi-family residential	65	3.9	77	85	90	92	85
39	9.8	B	Residential 1/8 acre	Multi-family residential	65	6.4	77	85	90	92	85
39	2.9	C	Residential 1/8 acre	Multi-family residential	65	1.9	77	85	90	92	90
40	13.0	B	Residential 1/8 acre	Multi-family residential	65	8.4	77	85	90	92	85
40	0.2	D	Residential 1/8 acre	Multi-family residential	65	0.2	77	85	90	92	92
41	16.0	B	Residential 1/8 acre	Multi-family residential	65	10.4	77	85	90	92	85
42	0.3	B	Residential 1/8 acre	Multi-family residential	65	0.2	77	85	90	92	85
43	6.8	B	Residential 1/8 acre	Multi-family residential	65	4.5	77	85	90	92	85
43	0.1	C	Residential 1/8 acre	Multi-family residential	65	0.1	77	85	90	92	90
43	0.0	B	Residential 1/8 acre	Multi-family residential	65	0.0	77	85	90	92	85
47	6.4	B	Residential 1/8 acre	Multi-family residential	65	4.1	77	85	90	92	85
47	4.5	B	Residential 1/8 acre	Multi-family residential	65	2.9	77	85	90	92	85
48	0.2	B	Residential 1/8 acre	Multi-family residential	65	0.1	77	85	90	92	85
49	19.8	B	Residential 1/8 acre	Multi-family residential	65	12.9	77	85	90	92	85
50	10.3	B	Residential 1/8 acre	Multi-family residential	65	6.7	77	85	90	92	85
50	0.1	C	Residential 1/8 acre	Multi-family residential	65	0.1	77	85	90	92	90
50	6.1	B	Residential 1/8 acre	Multi-family residential	65	4.0	77	85	90	92	85
52	4.2	B	Residential 1/8 acre	Multi-family residential	65	2.7	77	85	90	92	85
52	9.2	D	Residential 1/8 acre	Multi-family residential	65	6.0	77	85	90	92	92
53	4.4	B	Residential 1/8 acre	Multi-family residential	65	2.8	77	85	90	92	85
53	4.6	D	Residential 1/8 acre	Multi-family residential	65	3.0	77	85	90	92	92
54	10.8	B	Residential 1/8 acre	Multi-family residential	65	7.0	77	85	90	92	85
57	5.5	B	Residential 1/8 acre	Multi-family residential	65	3.6	77	85	90	92	85
59	10.1	B	Residential 1/8 acre	Multi-family residential	65	6.6	77	85	90	92	85
60	0.2	B	Residential 1/8 acre	Multi-family residential	65	0.1	77	85	90	92	85
60	1.7	C	Residential 1/8 acre	Multi-family residential	65	1.1	77	85	90	92	90
63	7.8	B	Residential 1/8 acre	Multi-family residential	65	5.1	77	85	90	92	85
64	7.5	B	Residential 1/8 acre	Multi-family residential	65	4.9	77	85	90	92	85
						305.7	**ac impervious**		**83.99%**	**of tot impervious**	
3	0.6	B	Road, Paved with storm drains	Secondary Roads and alleys	100	0.6	98	98	98	98	98
27	0.0	B	Road, Paved with storm drains	Secondary Roads and alleys	100	0.0	98	98	98	98	98
27	0.2	C	Road, Paved with storm drains	Secondary Roads and alleys	100	0.2	98	98	98	98	98
53	0.0	D	Road, Paved with storm drains	Secondary Roads and alleys	100	0.0	98	98	98	98	98
						0.8	**ac impervious**		**0.21%**	**of tot impervious**	
19	0.0	B	School	Institutional	85	0.0	89	92	94	95	92
20	2.5	B	School	Institutional	85	2.1	89	92	94	95	92
23	6.4	B	School	Institutional	85	5.5	89	92	94	95	92
23	3.5	B	School	Institutional	85	3.0	89	92	94	95	92
37	0.0	B	School	Institutional	85	0.0	89	92	94	95	92
39	0.0	B	School	Institutional	85	0.0	89	92	94	95	92
43	0.4	B	School	Institutional	85	0.4	89	92	94	95	92
44	0.1	B	School	Institutional	85	0.1	89	92	94	95	92
						11.2	**ac impervious**		**3.08%**	**of tot impervious**	
Total	**997.8**					**364.0**			**100.0%**		

Reaches

REACH	USELEV	DSELEV	TYPE	Length	Slope
114R	1518	1514	Valley	232.9	0.0172
121R	1420	1408	Valley	239.1	0.0502
126R	1509	1496	Street	248.7	0.0523
115R	1534	1518	Gravity Main	299.1	0.0535
113R	1514	1504	Valley	305.9	0.0327
123R	1450	1440	Street	352.2	0.0284
101R	1380	1374	Valley	379.3	0.0158
104R	1400	1398	Valley	393.6	0.0051
106R	1418	1408	Valley	400.3	0.0250
112R	1504	1495	Valley	405.3	0.0222
117R	1406	1390	Valley	458.0	0.0349
105R	1408	1400	Valley	459.2	0.0174
103R	1399	1390	Street	490.6	0.0183
109R	1460	1448	Valley	536.6	0.0224
127R	1487	1450	Street	544.5	0.0680
108R	1448	1433	Valley	566.6	0.0265
140R	1541	1518	Gravity Main	572.1	0.0402
119R	1422	1406	Street	599.6	0.0267
130R	1454	1440	Street	600.5	0.0233
110R	1474	1460	Valley	611.8	0.0229
128R	1490	1487	Street	623.1	0.0048
107R	1433	1418	Valley	631.5	0.0238
125R	1496	1471	Street	690.4	0.0362
111R	1495	1474	Valley	702.2	0.0299
144R	1552	1522	Valley	728.1	0.0412
143R	1621	1572	Hill	803.8	0.0610
120R	1474	1422	Street	830.8	0.0626
124R	1471	1450	Street	834.0	0.0252
122R	1440	1420	Street	918.3	0.0218
145R	1586	1552	Gravity Mainy	932.1	0.0365
131R	1501	1454	Street	993.0	0.0473
129R	1572	1490	Street	1006.0	0.0815
136R	1718	1602	Gravity Main	1025.8	0.1131
102R	1390	1380	Valley	1030.8	0.0097
142R	1572	1541	Street	1117.0	0.0278
139R	1774	1691	Street	1153.4	0.0720
116R	1576	1534	Gravity Main	1325.9	0.0317
138R	1691	1602	Valley	1393.4	0.0639
141R	1604	1541	Gravity Main	1495.9	0.0421
137R	1836	1718	Gravity Main	1871.6	0.0630
146R	1741	1586	Gravity Main	1947.7	0.0796
133R	1669	1501	Street	1959.6	0.0857
135R	1602	1460	Street	1999.4	0.0710
118R	1484	1406	Street	2025.9	0.0385
132R	1692	1501	Valley	2240.0	0.0853
134R	1833	1669	Street	2765.0	0.0593

85th Percentile Storm Results (P = 0.9 in.)					
DS Node	**Peak Inflow (cfs)**	**Peak Discharge (cfs)**	**Inflow Volume (ac-ft)**	**Discharge Volume (ac-ft)**	**Time to Peak (hh:mm)**
101R	77.1	76.9	30.1	30.1	19:50



GSI Water Solutions, Inc.

MEMORANDUM

Summary of Water Supply Benefits for a Proposed Infiltration Facility at Via Princessa Park (Santa Clarita, California)

To: Duong Do, PACE

From: John Porcello, GSI Water Solutions, Inc.
Ailco Wolf, PG, CHG, GSI Water Solutions, Inc.

Date: June 8, 2022

Introduction

This memorandum summarizes the results of groundwater modeling simulations of a proposed infiltration facility at Via Princessa Park in Santa Clarita, California. GSI Water Solutions, Inc. (GSI), conducted the modeling analysis as part of a hydrogeologic evaluation and feasibility study being led by PACE on behalf of the Los Angeles County Flood Control District (LACFCD) and the City of Santa Clarita (City). LACFCD and the City seek to capture and infiltrate certain wet-weather and dry-weather flows from Honby Channel, which is adjacent to the new Via Princessa Park that is currently being developed by the City. Stormwater would be captured and treated in surface treatment swales, then directed to infiltration basins to recharge the underlying Alluvial Aquifer. The feasibility study is being conducted under Los Angeles County's Safe Clean Water Program, which seeks to use stormwater capture, treatment, and infiltration as a strategy for increasing local water supplies.

Approach

The water supply benefits from the proposed Via Princessa infiltration facility were evaluated using a three-dimensional numerical groundwater flow model that was recently developed for the local groundwater basin during the preparation of a Groundwater Sustainability Plan on behalf of the Santa Clarita Valley Groundwater Sustainability Agency (GSI, 2021; GSI at al., 2022). The groundwater model simulates the two primary aquifers in the basin—the surficial Alluvial Aquifer, which is present beneath Via Princessa Park, and the deeper Saugus Formation, which lies just west of the park. Figure 1 shows the groundwater basin boundary, the outlines of these two aquifer systems, and the location of the Via Princessa Park property. Figure 2 shows the local area around the park, including the locations of nearby groundwater supply wells.

The model was used to simulate infiltration of Honby Channel flows just above the creek's confluence with the Santa Clara River during a 25-month period from January 2006 through January 2008. Precipitation records at a nearby monitoring station with the longest record in Santa Clarita (the Newhall Fire Station #73 gage) show that rainfall during this period (13.89 inches in 2006 and 5.78 inches in 2007) was generally below the 1930 to 2019 historical mean rainfall of 17.29 inches and also below the more recent 30-year (1990 to 2019) mean rainfall of 16.15 inches. Monthly rainfall in January 2008 was 13.83 inches, which is a monthly rainfall volume that has not been exceeded since then and is nearly as high as the monthly rainfall that occurred during a 4-month period of high rainfall from December 2004 through March 2005. That period created the highest streamflows in the Santa Clara River and its tributaries recorded so far during the 21st century.

The model simulated the following infiltration volumes during this 25-month period (see also Table 1):

- Seven months of 85th percentile events during 2006 that infiltrated 247.7 acre-feet (AF) of water
- Eight months of 85th percentile events during 2007 that infiltrated 172.5 AF of water
- A 100-year storm event in January 2008 that infiltrated 34.2 AF of water

Table 1. Simulated Infiltration Events

Month	Infiltration Volume (acre-feet)	Type of Event
January 2006	30.1	85th Percentile or Less
February 2006	53.2	85th Percentile or Less
March 2006	79.6	85th Percentile or Less
April 2006	30.8	85th Percentile or Less
May 2006	28.1	85th Percentile or Less
October 2006	4.8	85th Percentile or Less
December 2006	21.1	85th Percentile or Less
January 2007	43.0	85th Percentile or Less
February 2007	18.4	85th Percentile or Less
March 2007	1.1	85th Percentile or Less
April 2007	20.1	85th Percentile or Less
September 2007	31.2	85th Percentile or Less
October 2007	7.0	85th Percentile or Less
November 2007	10.7	85th Percentile or Less
December 2007	41.3	85th Percentile or Less
January 2008	34.2	100-Year Storm Event

Simulation Results

As shown in Figure 3, the groundwater model indicates that (1) the 100-year storm event would raise the elevation of the underlying water table in the Alluvial Aquifer by approximately 5 feet directly beneath the infiltration facility during the 100-year storm event, and (2) this mound would dissipate quickly after the 100-year infiltration event. The rapid rise and decrease of the water table directly beneath the infiltration facility would occur because of the high permeability of the sediments comprising the Alluvial Aquifer. The predicted rapid rise of the water table during a recharge event is consistent with long-term historical water level records at nearby production wells, which show that groundwater levels in the Alluvial Aquifer rise rapidly throughout the region during high-rainfall months. These records, well performance tests at nearby production wells, and calibration of the model to these two data sets together indicate that the horizontal hydraulic conductivity of the Alluvial Aquifer may be as high as 1,500 feet per day and that groundwater flow velocities likely range between approximately 50 and 250 feet per day in the Alluvial Aquifer.

Away from the proposed Via Princessa infiltration facility, the groundwater modeling results indicate that infiltrating multiple 85th-percentile storm runoff events from Honby Channel at the proposed infiltration facility could raise the water table in the surficial Alluvial Aquifer by 0.25 to 0.5 feet on a long-term basis. Away from the infiltration facility, a 100-year storm event could raise the water table by an additional 0.5 feet on a temporary basis, but the benefit of this event would dissipate within several months to a year if no similar size storms occur soon afterwards. The model also indicates that these increased groundwater elevations could occur not only at the nearest water supply wells (which are located across the river at the Santa Clarita Water Division [SCWD] North Oaks wellfield), but also at the next upstream water supply well (the SCWD-Sierra well, located one-half mile upstream of North Oaks) and even as far as 2 miles downstream of the proposed Via Princessa infiltration facility (at the SCWD-Santa Clara water supply well). See Figures 4, 5, and 6 for time-series plots at these three well locations that show groundwater levels with and without infiltration (the left-hand diagram in each figure) and the change in water levels arising from infiltration (the right-hand diagram in each figure).

Summary of Water Supply Benefits

Although the modeling analysis indicates that the proposed infiltration facility could raise groundwater levels in the surrounding area, the amount of the increase would be small enough that the ability to pump groundwater from water supply wells would not be significantly changed by implementing the project. This is indicated by the following observations:

1. On the scale of the entire groundwater basin, the proposed infiltration facility at Via Princessa Park would have the effect of spatially redistributing recharge to the Alluvial Aquifer rather than creating recharge that would not otherwise occur. Without the project, infiltration of the Honby Channel flows would occur further downstream in the basin—primarily (if not exclusively) in the central part of the basin (east of Interstate 5). This is indicated by long-term historical stream gaging records on the Santa Clara River at the Old Road Bridge, near Interstate 5. These records show that streamflow variations this far downstream in the groundwater basin are gradual at most times, with sharp runoff-driven changes in streamflow occurring only when the largest storm events (wettest months) occur. See Figure 7 for a hydrograph of daily streamflows from 2000 through 2021, and see Figure 8 for a similar hydrograph for the period that was simulated with the model (2006 through 2008). The low frequency of large-scale fluctuations in streamflow at the Old Road Bridge gage indicates that storm and runoff events in areas upstream of this gage are mostly infiltrating to groundwater upstream of this gage.
2. Groundwater levels in the Alluvial Aquifer at production wells near the proposed Via Princessa infiltration facility historically have fluctuated by much greater amounts (several tens of feet) in response to cycles of drought and above-normal rainfall than the amount of water level rise that would occur due to the infiltration facility. For that reason and given the other factors that affect decision making about daily and longer-term operations of individual wells, it is unlikely that the proposed infiltration facility at Via Princessa Park would significantly increase daily, monthly, or annual production volumes from nearby water supply wells.
3. Groundwater production from water supply wells further downstream (in the less climate-sensitive central and western portions of the basin) would not be materially affected by diverting recharge upstream to the proposed infiltration facility at Via Princessa Park. This is shown by historical records and groundwater modeling analyses, which together indicate that wells completed in the Alluvial Aquifer at and west of Bouquet Canyon Road are able to pump at their target rates during high- and low-rainfall periods because groundwater levels naturally fluctuate much less in this area than in the upstream portion of the watershed where the proposed infiltration facility would be located.
4. Multiple stormwater infiltration projects together could create a greater water supply benefit in this upstream area, without materially affecting groundwater production from water supply wells further downstream in the basin. The benefits in this upstream area would be even further enhanced by other recharge programs that are currently under consideration, such as recharging imported water into the Alluvial Aquifer in this area.

References

GSI. 2021. *Development of a Numerical Groundwater Flow Model for the Santa Clara River Valley East Groundwater Subbasin.* Prepared for the Santa Clarita Valley Water Agency. Prepared by GSI Water Solutions, Inc. (GSI). December 2021.

GSI, LSCE, ESA, Geosyntec, GHD, KJ, and RCS. 2022. *Santa Clara River Valley East Groundwater Subbasin Groundwater Sustainability Plan*. Prepared for Santa Clarita Valley Groundwater Sustainability Agency. Prepared by GSI Water Solutions, Inc. (GSI), Luhdorff & Scalmanini Consulting Engineers (LSCE), Environmental Science Associates (ESA), Geosyntec Consultants (Geosyntec), GHD, Kennedy Jenks (KJ), and Richard C. Slade & Associates LLC (RCS). January 2022.

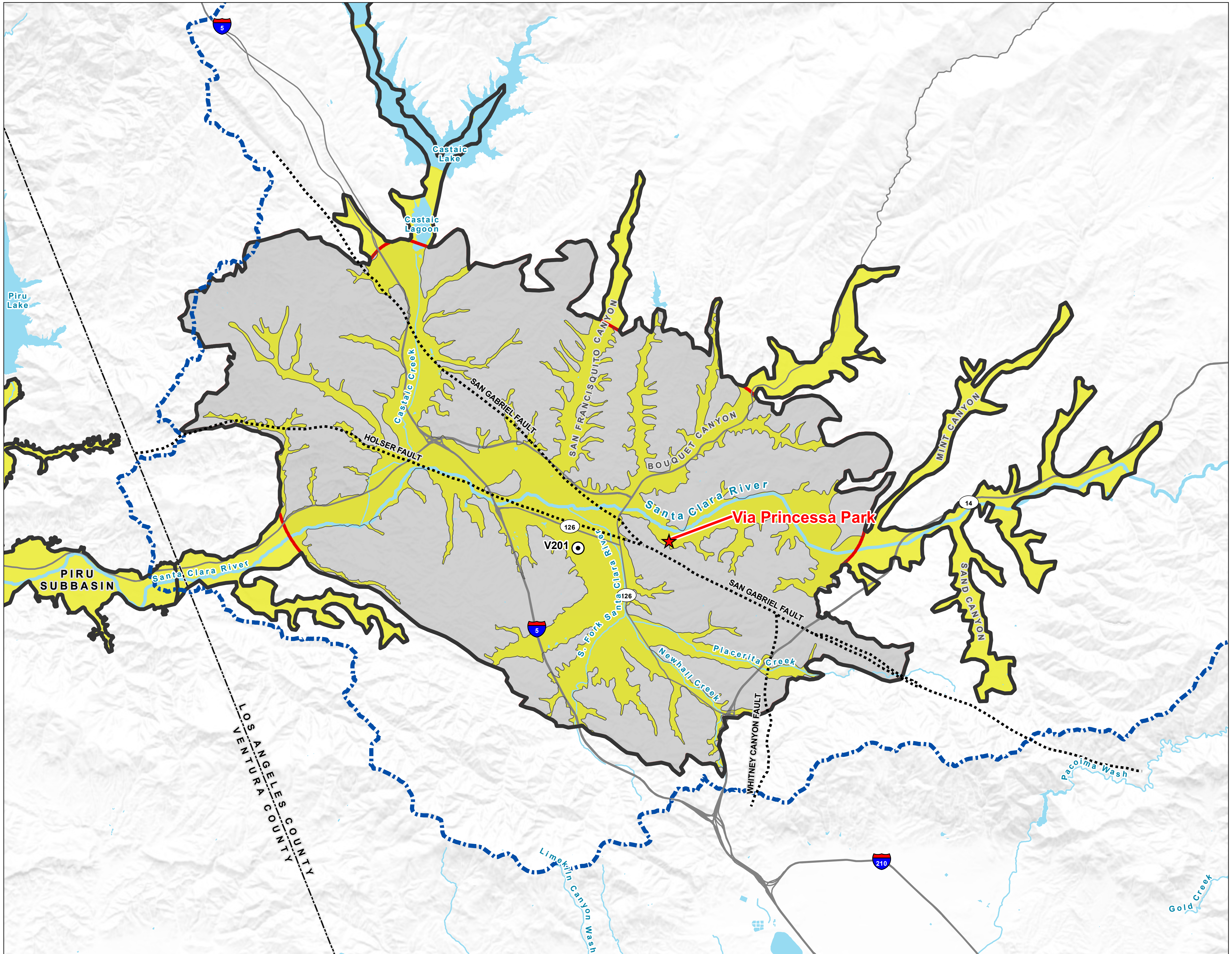


FIGURE 1
Location of Via Princessa Park, and Areal Extent of Alluvial Aquifer and Saugus Formation

Summary of Water Supply Benefits for a Proposed Infiltration Facility at Via Princessa Park (Santa Clarita, California)

LEGEND

- Well
- Alluvial Aquifer
- Saugus Formation
- Outer Margin of Saugus Formation at Locations Beneath the Alluvial Aquifer
- DWR Bulletin 118 Boundary for Santa Clara River Valley East Groundwater Subbasin
- Watershed Boundary

All Other Features

- Major Road
- Watercourse
- Waterbody

NOTE

DWR: California Department of Water Resources

N

0 5,000 10,000 15,000

Feet

Date: May 23, 2022

Data Sources: USGS, DWR Bulletin 118

GSI Water Solutions, Inc.

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FIGURE 2
Location of Via Princessa Park and Nearby Groundwater Supply Wells

Summary of Water Supply Benefits for a Proposed Infiltration Facility at Via Princessa Park (Santa Clarita, California)

LEGEND

★ Via Princessa Park

● Groundwater Supply Well

NOTE

SCWD: Santa Clarita Water Division of SCV Water
SCV Water: Santa Clarita Valley Water Agency

N

0 500 1,000
Feet

Date: May 31, 2022
Data Sources: BLM, ESRI, USGS, Aerial Photo 2020

GSI Water Solutions, Inc.

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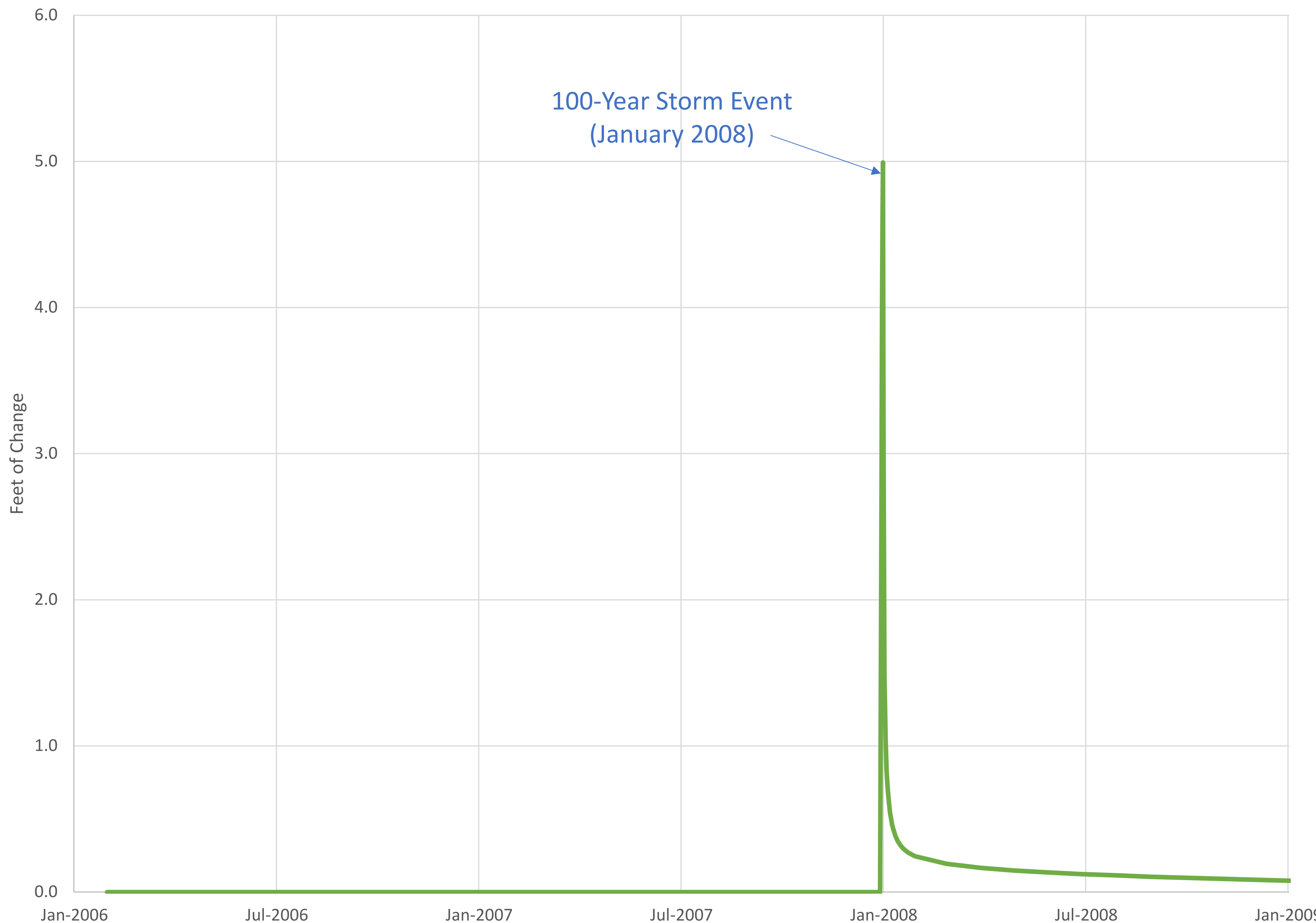

FIGURE 3

Change in Groundwater Elevation beneath the Infiltration Facility during the 100-Year Runoff Event in Honby Channel

Summary of Water Supply Benefits for a Proposed Infiltration Facility at Via Princessa Park (Santa Clarita, California)

LEGEND

Head Difference (January 2008 Event minus No Events)

Date: May 24, 2022

GSI Water Solutions, Inc.

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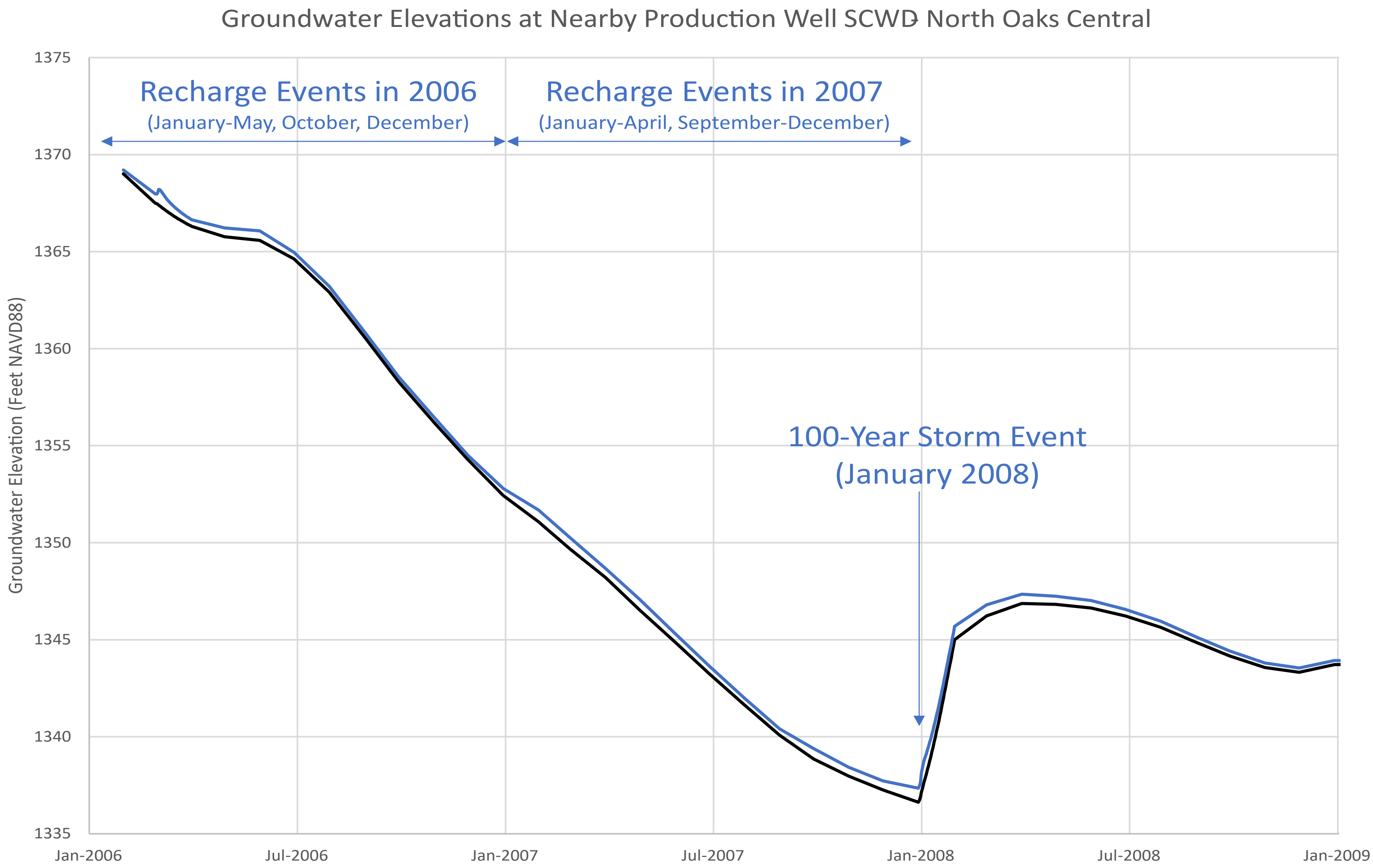

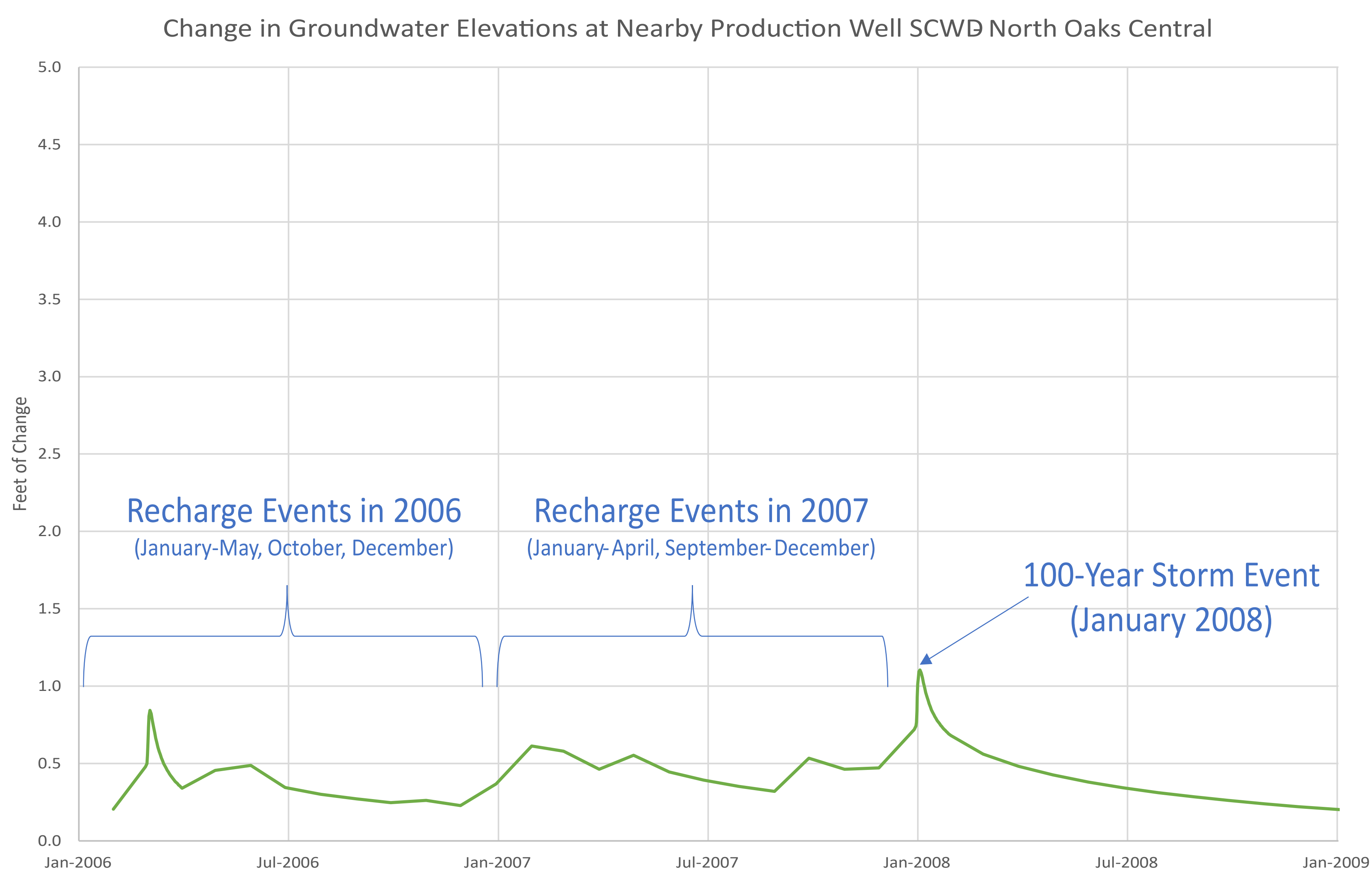

LEGEND

- No Recharge
- All Events
- Head Difference (All Events minus No Events)

FIGURE 4

Groundwater Elevations and Groundwater Elevation Changes at Nearby Production Well SCWD-North Oaks Central

Summary of Water Supply Benefits for a Proposed Infiltration Facility at Via Princessa Park (Santa Clarita, California)

NOTES

SCWD: Santa Clarita Water Division of SCV Water
SCV Water: Santa Clarita Valley Water Agency
NAVD 88: North American Vertical Datum 1988

Date: May 24, 2022

GSI Water Solutions, Inc.

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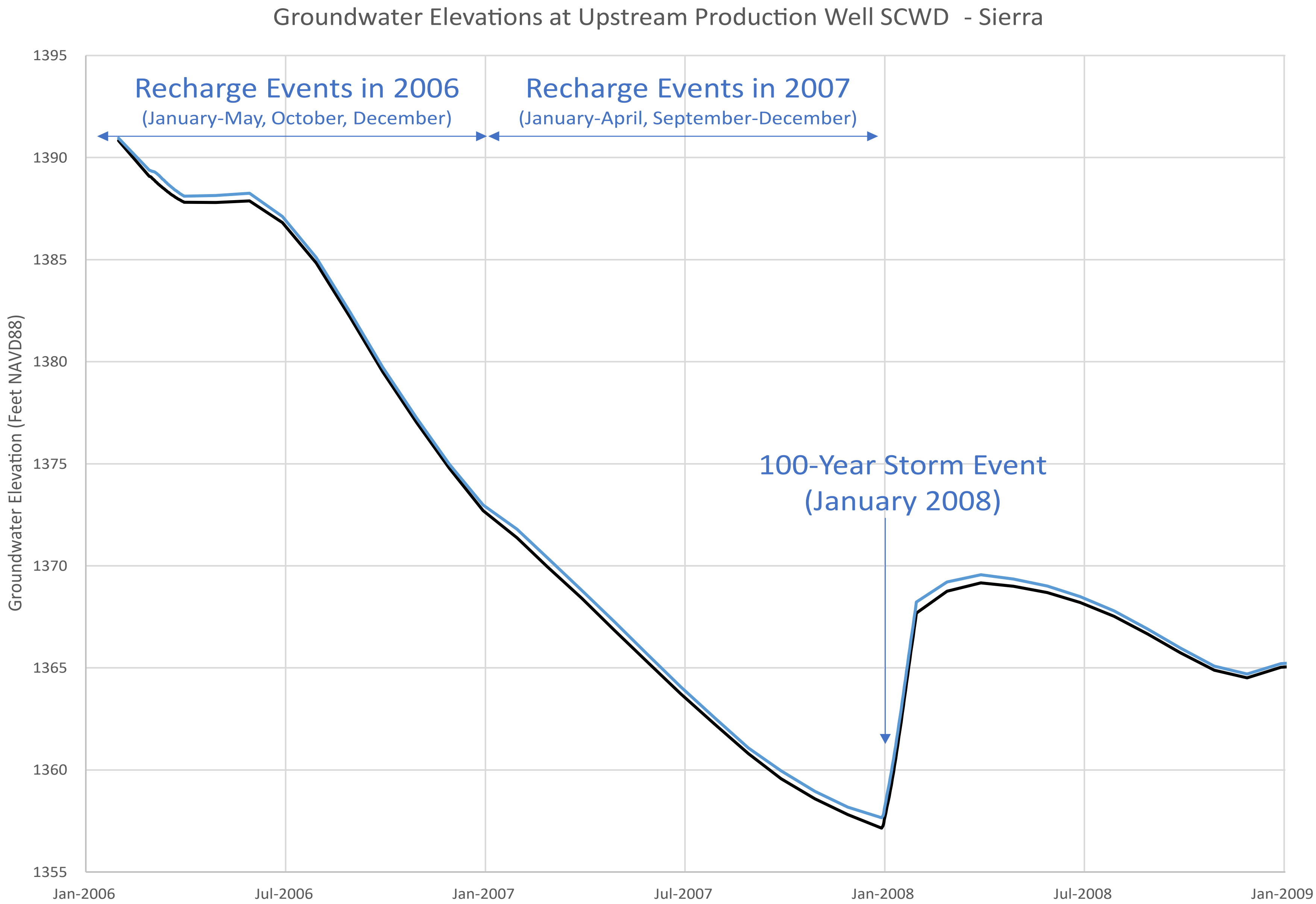
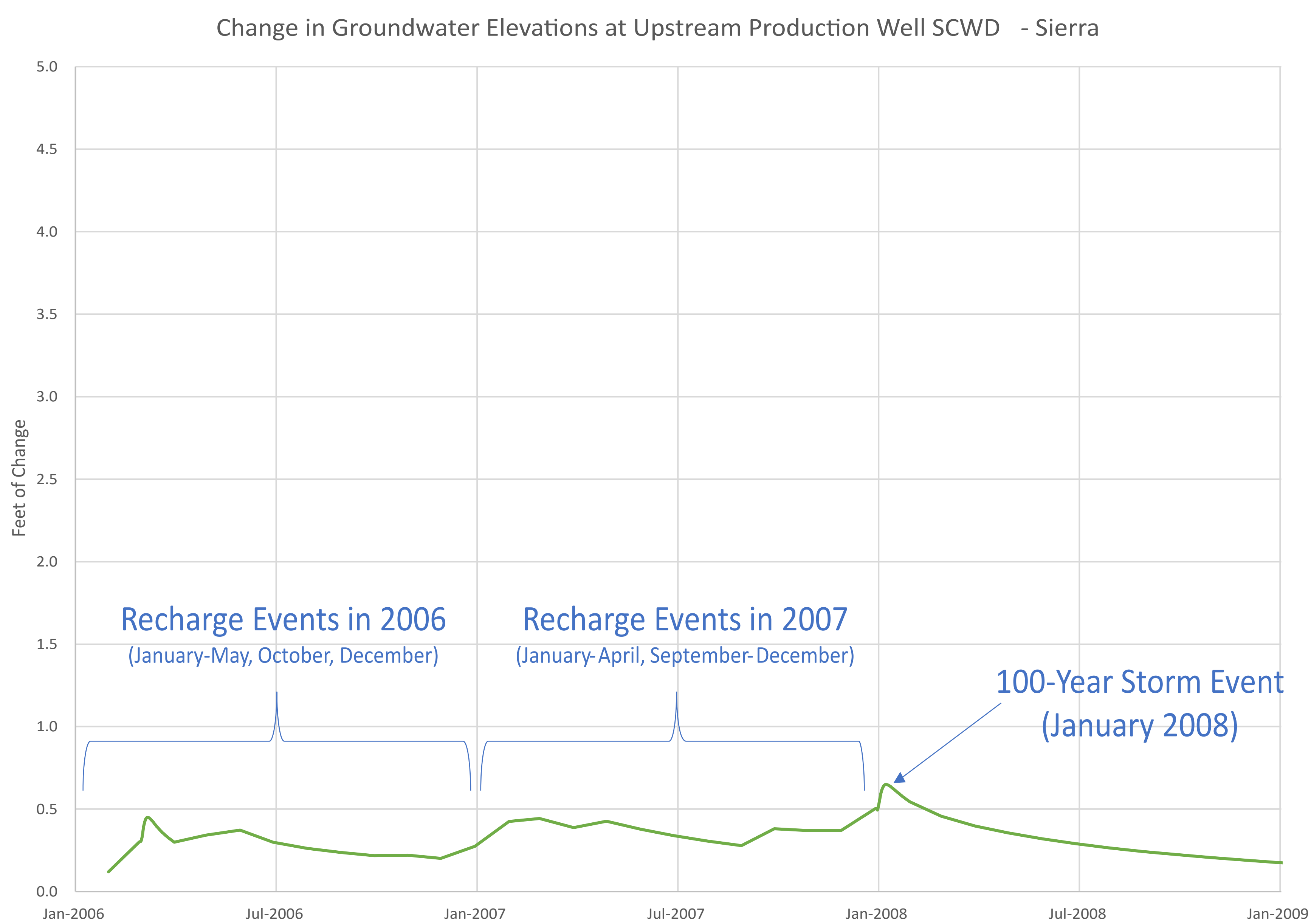




LEGEND

- No Recharge
- All Events
- Head Difference (All Events minus No Events)

FIGURE 5

Groundwater Elevations and Groundwater Elevation Changes at Upstream Production Well SCWD-Sierra

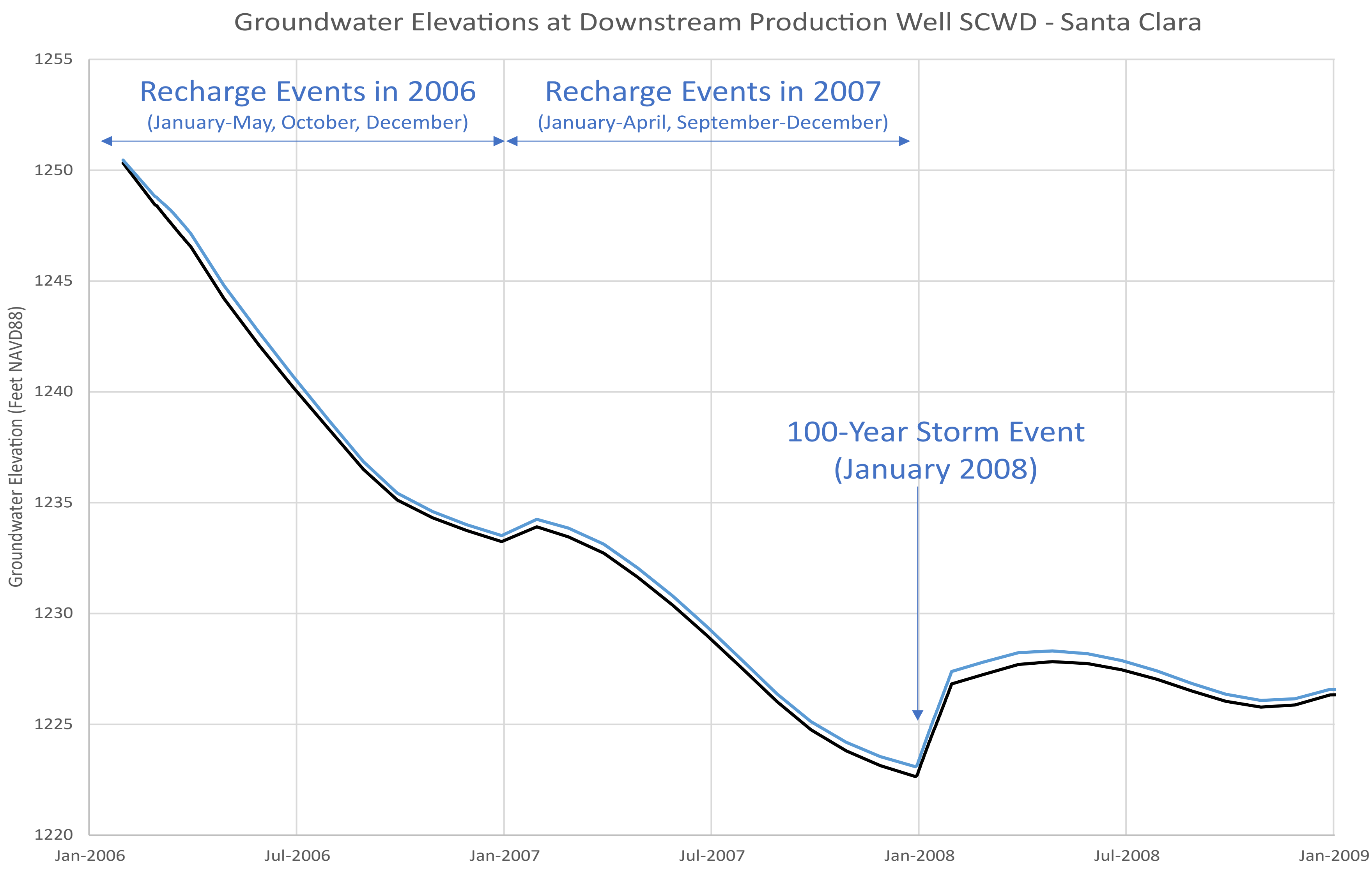
Summary of Water Supply Benefits for a Proposed Infiltration Facility at Via Princessa Park (Santa Clarita, California)

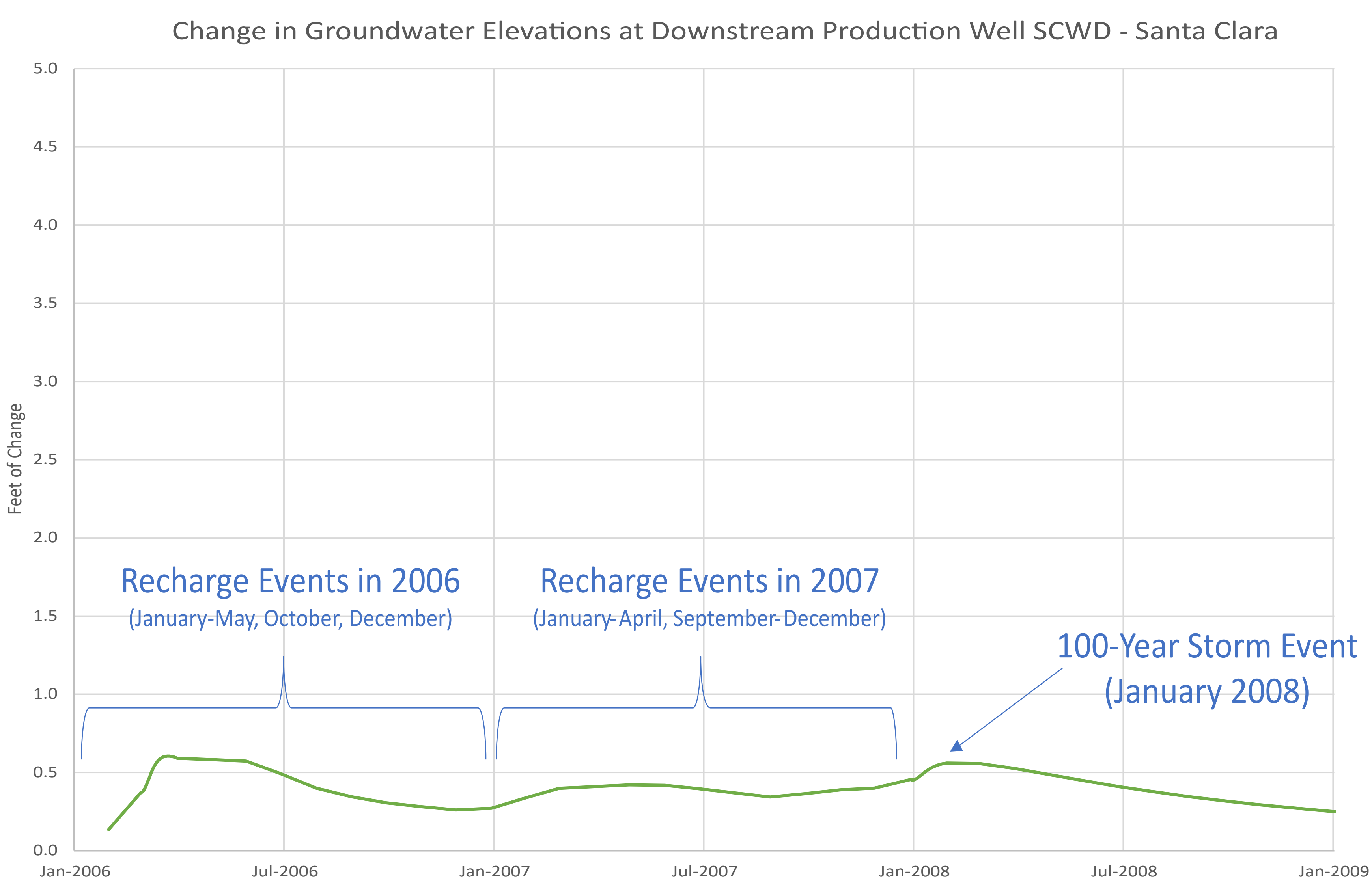
NOTES

SCWD: Santa Clarita Water Division of SCV Water
SCV Water: Santa Clarita Valley Water Agency
NAVD 88: North American Vertical Datum 1988

Date: May 24, 2022

GSI Water Solutions, Inc.





LEGEND

No Recharge
All Events
Head Difference (All Events minus No Events)

FIGURE 6

Groundwater Elevations and Groundwater Elevation Changes at Downstream Production Well SCWD-Santa Clara

Summary of Water Supply Benefits for a Proposed Infiltration Facility at Via Princessa Park (Santa Clarita, California)

NOTES

SCWD: Santa Clarita Water Division of SCV Water
SCV Water: Santa Clarita Valley Water Agency
NAVD 88: North American Vertical Datum 1988

Date: May 24, 2022

GSI Water Solutions, Inc.

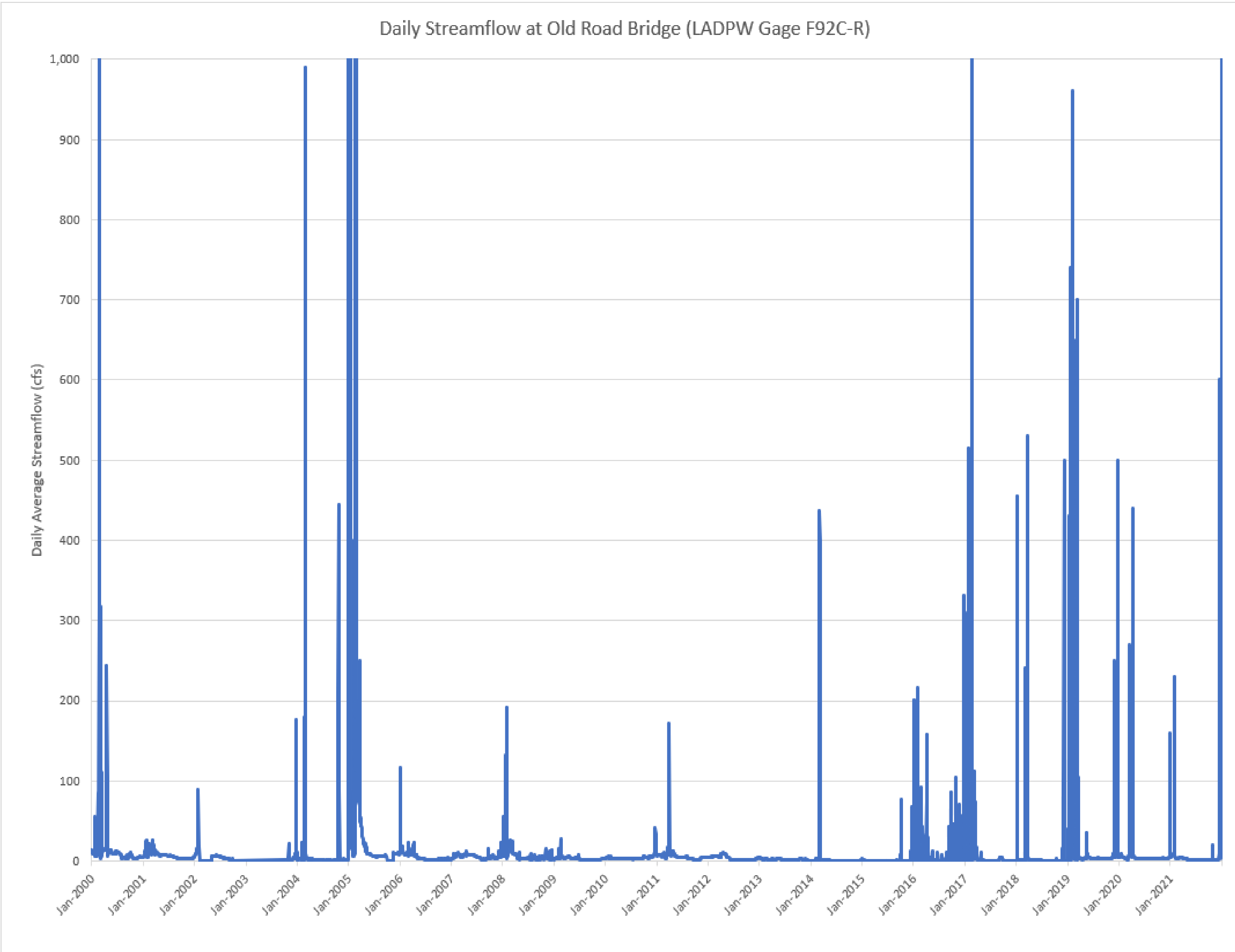


FIGURE 7

Daily Santa Clara River Streamflow at LADPW Gage 92C-R at Old Road Bridge (2000-2021)

Summary of Water Supply Benefits for a Proposed Infiltration Facility at Via Princessa Park (Santa Clarita, California)

NOTES

LADPW: Los Angeles County Department of Public Works

cfs: cubic feet per second

Date: May 24, 2022

GSI Water Solutions, Inc.

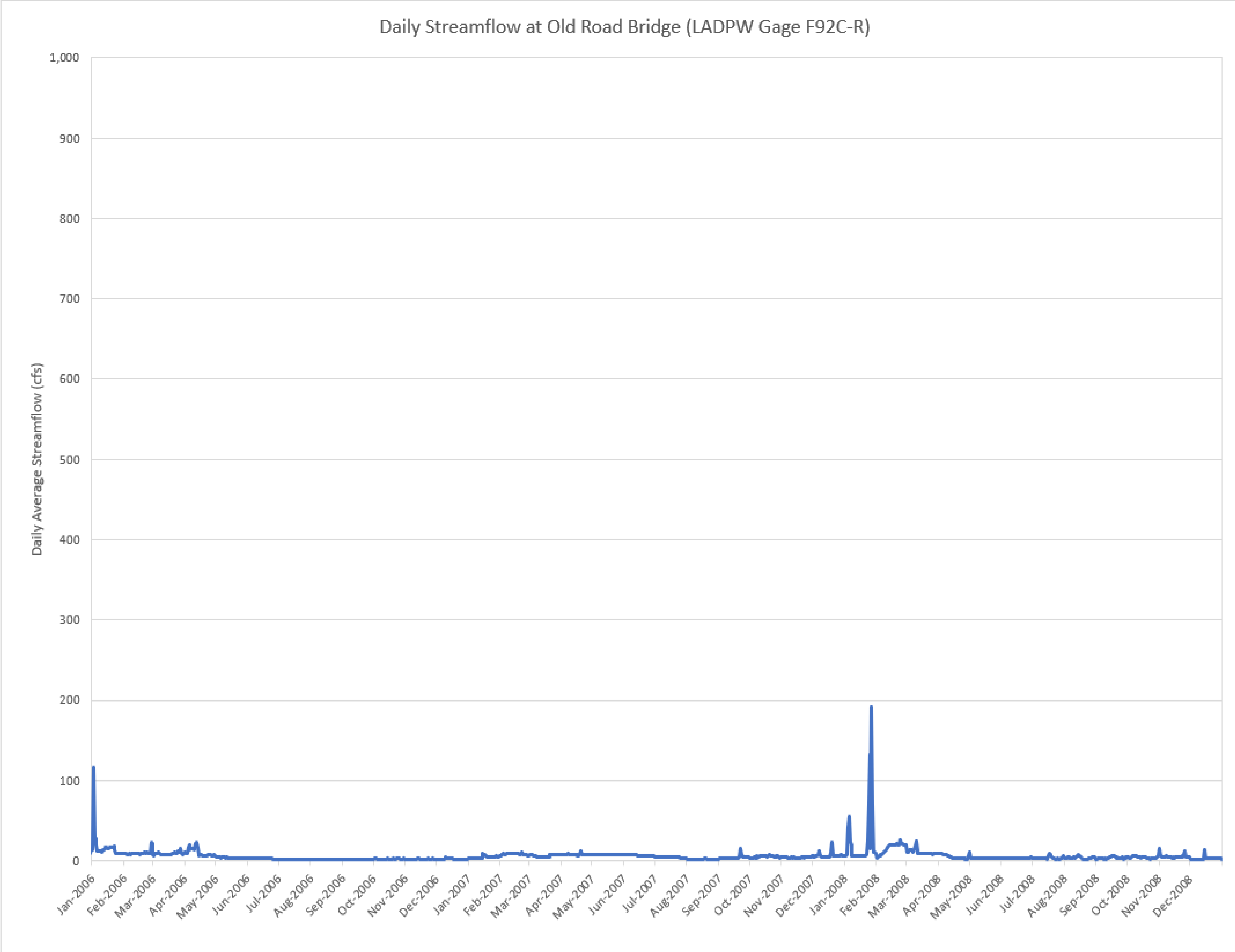


FIGURE 8

Daily Santa Clara River Streamflow at LADPW Gage 92C-R at Old Road Bridge (2006-2008)

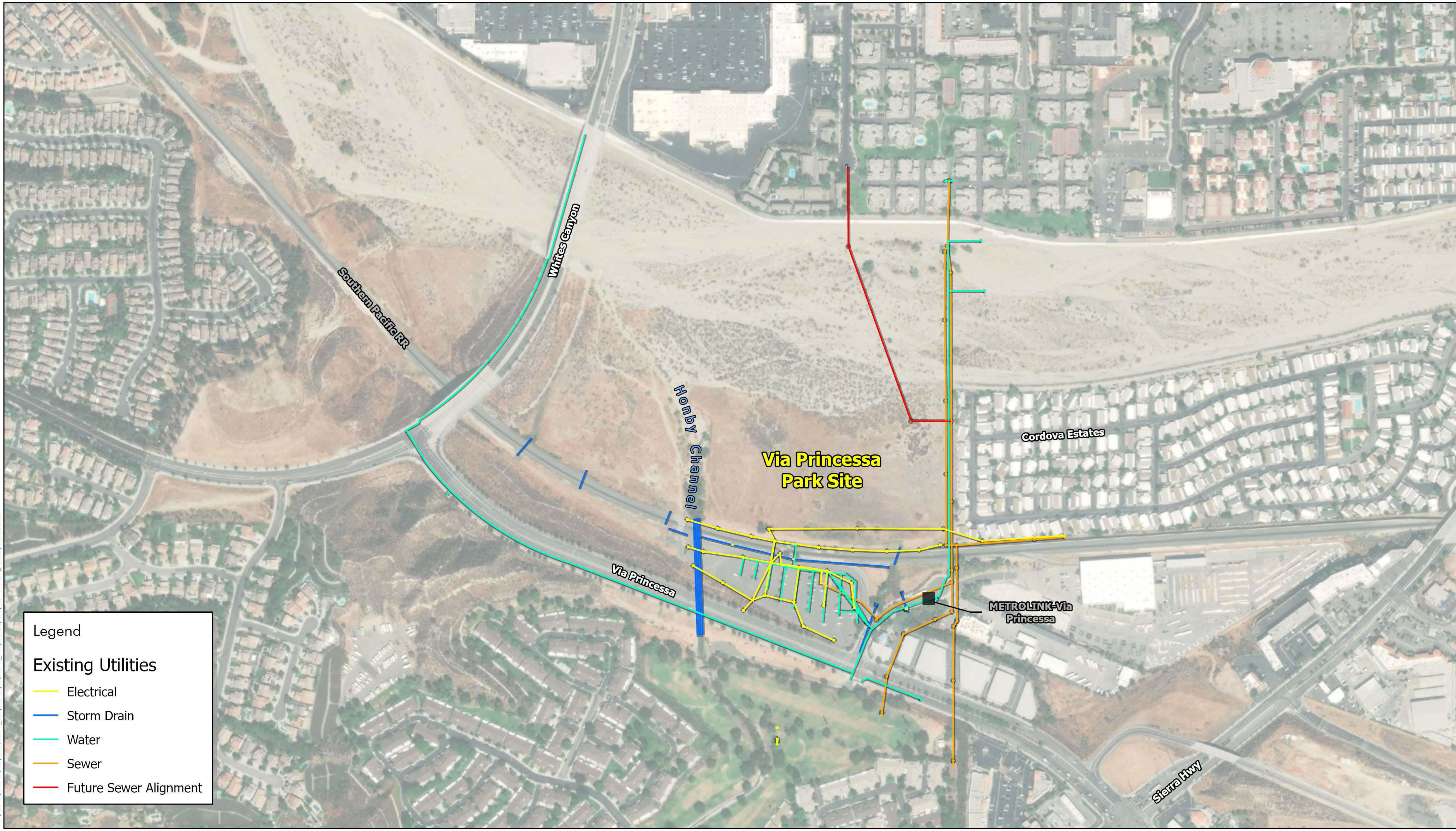
Summary of Water Supply Benefits for a Proposed Infiltration Facility at Via Princessa Park (Santa Clarita, California)

NOTES

LADPW: Los Angeles County Department of Public Works
cfs: cubic feet per second

Date: May 24, 2022

GSI Water Solutions, Inc.



W:\B894\6-GIS\Projects\B894_ProjectMaps\B894_ProjectMaps.aprx - Existing Utility Locations

VIA PRINCESSA PARK AND BMP PROJECT

EXISTING UTILITY LOCATIONS

PACE Advanced Water Engineering

N

0 200 400 800 Feet

Date: 5/12/2022

Job Number: B894

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ATTACHMENTS FOR SECTION 2.5:

MONITORING

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Via Princessa Park and Regional BMP Project

Monitoring Plan

May 2022

Prepared For:

City of Santa Clarita

Prepared By:

Pacific Advanced Civil Engineering, Inc.
17520 Newhope Street, Suite 200
Fountain Valley, CA 92708

Contact Persons:
Duong (Young) Do, PE
Cherise Thompson, EIT

PACE JN B944

1.0 Introduction

The proposed project at the Via Princessa site will involve above-ground improvements including a park with multipurpose fields, native landscaping, education opportunities, and play areas, among others. The site will also incorporate a subterranean infiltration facility, which will capture and infiltrate stormwater runoff (up to the 85th percentile storm). The flows that enter the infiltration facility will be diverted from the nearby Honby Channel via an overflow device. The infiltration facility will help sustain/increase groundwater levels in the Eastern Santa Clara Valley Groundwater Basin and make it easier to manage/operate nearby production wells. In addition to the groundwater benefits, the infiltration facility will also treat pollutants associated with the 85th percentile storm runoff, preventing them from reaching downstream water bodies, such as the Santa Clara River.

After the project is completed, specific monitoring is planned to take place, in order to evaluate the effectiveness of the facility. The details associated with the monitoring are presented in the following sections.

2.0 Monitoring Plan

The objective of the monitoring plan is to evaluate the effectiveness of the infiltration facility after the project is completed, and to guide City staff in performing the required observations, measurements, and sample collection.

The objective to capture/infiltrate the 85th percentile storm runoff will be monitored by measuring inflow. This can be achieved by installing a flow meter/gage or other continuous measuring device. Site visits will also include visual observations and estimates of the bypass flows.

The objective to reduce the pollutant loading on the Santa Clara River will be achieved by collecting water samples of the stormwater in the Honby Channel upstream and downstream of the proposed diversion. Some dry-weather flow, as well as 85th percentile storm flows, will be diverted to the infiltration facility, but some dry-weather flows will continue downstream, in order to sustain the vegetation planted in the streambed. All pollutants contained within the diverted water will be captured and infiltrated and can be considered as eliminated from downstream water bodies. As such, monitoring will need to take place both upstream and downstream of the diversion, in order to evaluate the reduction in pollutant loading affected by the proposed project.

Specific pollutants of concern that have been listed for the water bodies near the project are bacteria (specifically E. Coli.), copper, mercury, and cyanide. Water samples taken upstream and downstream of the project will be tested for concentration levels of these pollutants.

2.1 Monitoring Plan Development

This monitoring plan has been developed as part of the Feasibility Study submitted to the Safe Clean Water (SCW) Program, in pursuit of Measure W funds for the project. Funds to support the monitoring plan described herein are being requested from SCW. Because the project is not in final design stages, this monitoring plan is only able to provide details at a generalized level. A more detailed monitoring plan is anticipated to be developed after final project design has been completed. Such details will include, but not be limited to, locations of where water quality samples will be taken, location of flow measurement devices, locations of manhole access points for the infiltration facility, hydrodynamic separators, diversion line, and diversion structure, laboratories used to analyze samples taken, observation logs, field health & safety procedures, etc.

2.2 Monitoring Strategy

The effectiveness of the infiltration facility will be evaluated during both dry- and wet-weather flows. In existing conditions, continuous dry weather flow has been observed in Honby Channel, so it is anticipated that this will persist in proposed conditions. A portion of the dry-weather flow will be diverted to the infiltration facility, but some will continue downstream through a low-flow perforation in the channel. The dry-weather flow bypassing the diversion will help sustain some vegetation that will be planted in the streambed. It is anticipated that samplings upstream and downstream of the diversion will take place in dry-weather flow conditions. Visual observations can also be used to approximate the flow rate or ratio of flow that is being diverted/bypasses the diversion. During dry-weather flow, the diversion structure, diversion line, and hydrodynamic separators will all be more accessible for observation/measurement than during rain events. Manhole access to each of these system components can be used to evaluate sediment/trash buildup, the condition of screens and filters, etc.

Similarly, in wet-weather flow conditions, most of the runoff in Honby Channel will be diverted to the infiltration facility, up to the 85th percentile storm event. Flows in excess of this will bypass the diversion, continuing downstream. It is anticipated that samplings upstream and downstream of the diversion will take place in wet-weather flow conditions. "First-flush" rain events at the beginning of the rainy season are especially important to monitor, as they typically carry a higher concentration of pollutants than other storm events. During wet-weather flow conditions, visual observations can also be used to approximate the flow rate or ratio of flow that is being diverted/bypasses the diversion.

Flow rate and water quality sampling/monitoring is anticipated to be performed during six (6) wet-weather and two (2) dry-weather events over the course of two years. Based on the recorded observations, the monitoring plan can be adjusted accordingly to include a more appropriate frequency and sampling/observation strategies.

2.3 Flow Monitoring

Flow rate monitoring will likely take place in the diversion line, between the diversion structure and the hydrodynamic separators. Flow measurements will take place continually over a specified period of time, recording both dry- and wet-weather flow events. Specific technology for measuring the flow rates in the diversion line has not yet been selected; however, a variety of options exist which are capable of satisfying the level of monitoring desired for the project.

Upon installation of the flow monitoring device, it shall be calibrated to ensure accurate recording of data. Monitoring and maintenance of the flow monitoring device will be as required by the manufacturer and shall be specified at a later phase of the project design.

2.4 Runoff Volume and Pollutant Load Estimation

In addition to site-specific flow monitoring, estimated runoff for each storm event will also be calculated using rain gage data and characteristics of the watershed draining to the diversion point in Honby Channel. The runoff volumes/flow rates calculated will be compared to those measured at the infiltration facility. These calculations can also be calibrated over time to better model the watershed conditions and understand the infiltration facility's performance.

2.5 Monitoring Locations

Specific locations for flow rate and water quality sampling will be decided at a later phase of the design. However, water quality sampling, in general, will take place both upstream and downstream of the diversion point within Honby Channel. Flow monitoring will likely take place within the diversion line itself, between the diversion structure and the hydrodynamic separators.

3.0 Mobilization & Testing

3.1 Wet-Weather Mobilization

Weather forecasting can be tracked using the National Weather Service website's alert system. Wet-weather mobilization will be triggered by storms with predicted rainfall of 0.25 inches or more, with at least 70% probability of occurring.

3.2 Dry-Weather Mobilization

Dry-weather flows have been observed at the project year-round, with higher amounts of flow present in the winter. Dry-weather monitoring will be conducted once per year for the first two years, during the dry season (Between May 31st and October 1st).

3.3 Laboratory

For testing of the water quality samples, a laboratory with Environmental Laboratory Accreditation Program (ELAP) certification will be selected. Constituents to be analyzed will include bacteria (specifically E. Coli.), nitrogen compounds, chloride, copper, mercury, and cyanide.

4.0 Health and Safety Plan

A health and safety officer will be appointed for the project, who will take charge of the following:

- Ensure that Occupational Safety and Health Administration (OSHA) and CalOSHA health and safety practices and local safety regulations are followed.
- Prepare, maintain, and periodically update the project health and safety binder, with special consideration of additional measures necessary to minimize the risk of spreading or contracting COVID-19, if applicable.
- Provide initial training and mandatory re-training of all field personnel.
- Document training, including signature sheets, when appropriate.
- Communicate new Corporate safety and injury prevention practices.
- Prepare tailgate briefings of field staff before each trip to reinforce safety priorities.

Health and safety information will be included in binders for use by field staff. Binders will contain information relevant to the field activities that will be performed. Information in the binders will be updated if/when new information is discovered. A copy of the health and safety information, containing site-specific information, will be available to each field crew before the first sampling event. The health and safety binder will include the following types of items:

- Maps showing nearest hospital and quickest route from key locations, plus alternate routes.
- Contact information of emergency resources.
- Map showing areas of concern or potential hazards as gleaned from reconnaissance activities
- Checklists: vehicle safety, health and safety equipment, etc.
- Instructions for chemical spill, automotive accident, and personal injury response.

Field staff will be responsible for proper collection and disposal of sample collection wastes, such as acid preservatives. The laboratory will be responsible for proper disposal of wastes according to their own protocols.

ATTACHMENTS FOR SECTION 2.6:

O & M

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City of
SANTA CLARITA

23920 Valencia Boulevard • Santa Clarita, California 91355-2196
Phone: (661) 259-2489 • FAX: (661) 259-8125
www.santa-clarita.com

April 19, 2022

Regional Oversight Committee
Safe Clean Water Program
Los Angeles County Flood Control District

(626) 458-5100

900 S. Fremont Ave.
Alhambra, CA 91803

Re: Via Princessa Park and Storm Water Infiltration BMP Operation and Maintenance Letter of Commitment

Dear Regional Oversight Committee,

This letter is the City of Santa Clarita's commitment for the operation and maintenance of the proposed Via Princessa Park and Storm Water Infiltration BMP.

Responsible Agency

All operations and maintenance of the Project will be overseen by the City of Santa Clarita's Department of Public Works. All designated maintenance crew members should have an intermediate level of work experience in maintaining the project's components.

Scope of O&M Plan

The Operations and Maintenance components constructed as part of the Via Princessa Park and Storm Water Infiltration BMP Project will include inspection and maintenance activities associated with the diversion structure, hydrodynamic separator, BMP infiltration gallery, and restored Honby Channel conveyance area.

Diversion Structure Activities

The diversion structure shall be inspected for accumulation of sediment/debris in the sump, obstructions to the diversion pipe leading to the proposed facility, or accumulation of sediment/debris at the entrance to the diversion structure within Honby Channel. During the first two years after construction, the diversion structure will be inspected after every storm event and, at a minimum, twice per year. If large debris or obstructions are observed in the sump of the entrance to the diversion structure or within the diversion structure sump or at the opening of the pipe leading to the proposed infiltration facility, they will be removed. Additionally, once sediment depth within the sump exceeds three (3) inches, the sediment unit shall be cleaned out with a vacuum truck. Sediment/debris within three (3) inches of the diversion structure opening shall be removed as well.

Hydrodynamic Separator Activities

The hydrodynamic separator(s) will require maintenance in conformance with manufacturer specifications and maintenance procedures. Typically, these tasks include inspection at least twice per year (e.g. spring and fall) and after each storm event during the first two years. In general, inspection events should be twice as frequent as maintenance events. Inspection is performed by opening the manhole access covers to inspect the contents of the systems. No confined space entry is required. Inspection will take place for any damage to the system components, blockages, obstructions, sediment accumulation, and accumulated debris. Damages shall be reported and any blockages shall be removed.

When sediment occupying more than 25% of the depth of the solids storage sump, the unit shall be cleaned by a vacuum truck. If the hydrodynamic separator includes absorbent material for removal of hydrocarbons, the material shall be inspected and discoloration noted. The material should be replaced prior to full discoloration or per manufacturer's requirements. The system components are expected to last at least 50 years without replacement. Screen components should not need to be replaced if subjected to typical trash loads and design flow rates. If necessary, the separation screen can be cut out and removed through the manhole access point over the separation cylinder. A new screen could be installed by passing screen sections through the manhole access point and fastening it in place. Any other damaged components shall be replaced and minor repairs of components is acceptable if agreed to by the manufacturer.

A typical cleaning usually is performed by a two-person crew using a vacuum truck, a manhole pick, and the tools normally found on a vacuum truck. The vacuum truck hose is extended into the vortex separator and sediment forebay and the water, trash, and sediment are vacuumed out. A small system can be cleaned in approximately 30 minutes. Large systems can take longer, depending on the capacity of the vacuum truck. Non-routine pollutants, including large volumes of oil or grease, lumber, etc. require more extensive procedures. All cleaning activities can be performed without entering the unit. The screen and forebay and other internal components should be power washed once the facilities are substantially emptied. The power wash rinse water should be vacuumed from the storage sump to ensure that all captured pollutants are removed. City staff will profile all waste for appropriate disposal.

Infiltration Gallery Activities

The infiltration gallery must be inspected quarterly and one inspection shall occur 30 days prior of October 1st. Inspection should also take place after every storm event during the first two years. The inspection history will inform the schedule for future inspections and maintenance. Inspection is the key to effective maintenance and is easily performed. The rate at which the system collects pollutants will depend heavily on site-specific activities rather than the size or configuration of the system. Inspections should take place more frequently where higher accumulations of sediment or abrasive/corrosive conditions may exist.

When sediment depth in the infiltration gallery exceeds three (3) inches, the infiltration gallery shall be cleaned out with a vacuum truck. Accumulated sediment and trash can typically be evacuated through the manholes. Manhole covers should be securely seated following cleaning activities. If inspectors observe any salt or other corrosive substance concentrations or accumulations in the system, or if salt or other corrosive substances are used or prevalent near the system, they will rinse the system above the spring line annually between late spring and early summer as part of the maintenance program. Should it be necessary to get inside the system to perform maintenance activities, all appropriate precautions regarding confined space entry and OSHA regulations should be followed, especially for confined space entry.

Maintaining an underground detention or retention system is easiest when there is no flow entering the system. For this reason, it is a good idea to schedule the cleanout during dry weather. Cleanouts may include vacuum trucks, dredging material manually or with equipment, removal and disposal of the material.

Restored Honby Channel Conveyance Area

The restored conveyance area at the outlet of culvert running beneath Via Princessa Rd. will need to be inspected quarterly for erosion, overgrown or dying vegetation, sediment accumulation, damage to overflow devices, and trash or other visible contaminants/pollution. Maintenance activities will include removing any dead vegetation, trimming overgrown vegetation, removing excessive sediment buildup, repairing damaged overflow devices, and removing trash or other visible contaminants/pollution.

Mowing is only necessary once or twice per year; more often if safety, aesthetics, or prevention of woody vegetative growth is desired.

Frequency of trash removal depends on what is observed during routine maintenance, but should always be performed before any mowing.

The restored creek will also be inspected quarterly by vector control to observe the presence/breeding of any pests and take corrective action as necessary. Standing water should be addressed promptly to avoid vector breeding and the cause of ponding should be identified and remedied.

It is expected that the following maintenance activities, in general, will not submit pre-maintenance notification or require any reporting due to their size and likelihood of generating sensitive habitats or supporting special-status species:

- Vegetation clearing or sediment removal from seasonally dry culverts and storm drain outlets, if maintenance is conducted during periods of no flowing water, and nesting birds are not present.
- Visual inspections, where no equipment access is required. This may include hand trimming of brush, scrub species, or minor pruning of native trees to facilitate access (foot trail).

It is anticipated that all other maintenance activities would provide notification to the applicable Agencies to ensure adequate protection of Federal and State Endangered (ESA) and California Species of Special Concern species during maintenance activities, although where jurisdiction is not present, that notification will be at the discretion of the City.

I, Scott Hamilton, a representative of the City of Santa Clarita, Department of Public Works, agree to the aforementioned maintenance activities and agree to the responsibility of their performance by the City of Santa Clarita, Department of Public Works.

Scott [signature] 4/29/22

Signature Date

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ATTACHMENTS FOR SECTION 3.3:

24-HOUR STORM CAPACITY

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March 30, 2022

Pacific Advanced Civil Engineering
17520 Newhope Street, Suite 200
Fountain Valley, California 92708

Job No. 2018-003-054

Attention: Mr. Duong Do, P.E.

Subject: Report of Geotechnical Investigation and Infiltration Study
Proposed Site X Regional Infiltration BMP
Northwest of Existing Via Princessa Metrolink Station
Santa Clarita, California

Reference: See Attached List of References

Gentlemen:

This Report of Geotechnical Investigation and Infiltration Study presents the results of our site investigation and in-situ infiltration testing that was performed to help support the design of the proposed Regional Infiltration BMP on the Site X site (the site). This report also includes general geotechnical recommendations for minor improvements during site development. The work was performed in consideration of the Los Angeles County Department of Public Works (LACDPW), Administrative Manual GS 200.2, "Guidelines for Geotechnical Investigation and Reporting, Low Impact Development (LID) Storm Water Infiltration," dated June 30, 2017 (LACDPW, 2017).

Included with and completing this report are References, a Geotechnical Plot Plan (Figure 1), a Historically Highest Ground Water Contour Map (Figure 2), a Water Well Location Map (Figure 3), Explorations (Appendix A), Laboratory Test Data (Appendix B), Infiltration Test Data and Calculations (Appendix C), Water Well Records (Appendix D), and Geosyntec Technical Memorandum (Appendix E).

INFILTRATION TEST RESULTS

When the Boring Percolation Test procedure is performed, the County guidelines dictate that several reduction factors be applied to the infiltration rates obtained in the field when designing LID features. The field infiltration rates for the two infiltration borings were recorded and are presented in the summary presented below. However, when County-recommended corrections for borehole diameter (RFt) are applied, it results in a reduction of the field infiltration rates. The County requires additional reduction factors for site variability, number of tests, and thoroughness of investigation (RFv) as well as for long-term siltation, plugging, and maintenance (RFs).

The County indicates that a reduction factor of 2 should be used for the boring percolation test method (RFt). Based on the subject geotechnical investigation and our infiltration testing, a value of 2 was used for RFv. A value of 2 was also used for long-term siltation, plugging, and maintenance (RFs). The RFs value of 2 is based on future infiltration systems being maintained on a bi-annual basis and some form of pre-treatment being provided. These reduction factors may be increased or decreased by the infiltration designer and are to be based upon their experience, recommendations for maintenance, and specific design details of the infiltration system.

As a result of the field testing, and when all of the various County mandated reduction factors are applied, it is recommended that the infiltration rates provided in the following table be used in the design for LID features at the site. LID features should be designed to infiltrate within the sandy, naturally deposited soils that are expected to be present at the depths and locations of where our infiltration testing was performed.

The boring field infiltration test results and correction factors are summarized in the table presented below. The infiltration testing results are also summarized in the "Boring Percolation Testing Field Logs" included in Appendix C of this report.

Infiltration Location	Approximate Infiltration Test Elevation (in feet)	Material at Infiltration Elevation	Field Infiltration Rate* (in/hr)	Boring Reduction Factor (RFt)	Boring Corrected Field Infiltration (in/hr)	RFv	RFs	Design Infiltration Rate (in/hr)
IB-1	1362	silty sand	46.80	2	23.40	2	2	5.85
IB-2	1361½	silty sand	22.24	2	11.12	2	2	2.78

* Average of last three readings
** For LID features established in naturally deposited sandy soils

CONCLUSIONS

As summarized in the above table, each of the tests meet the minimum infiltration requirement of at least 0.3 inches per hour as required within the LACDPW Administrative Manual GS 200.2 (LACDPW, 2017). The application of average infiltration rates, as indicated on the attached Preliminary BMP Layout Plan (Figure 2), was coordinated with the BMP designer based on the recommended design infiltration rates shown above.

Groundwater was not observed during our site investigation. Boring B-4 was drilled to an approximate elevation of 1,331 msl and did not encounter ground water. CPT-1 sounding was advanced to a depth of about 44-feet and also did not encounter ground water. The historically high groundwater map developed by CGS would suggest a conservative historically high ground water elevation of below 1,360 msl. The latest readings of the three adjacent LACDPW water wells indicate water levels that varied from 81- to 85-feet below ground surface at elevations varying from approximately 1287 to 1299 msl. The LACDPW Administrative Manual GS 200.2 (LACDPW, 2017) indicates that existing groundwater data may be used to verify the seasonal high groundwater elevation.

The proposed invert elevations, based on a depth of approximately 20-feet below existing ground surface, would vary from approximately 1360 to 1361 msl. The site generally meets the minimum seasonal high groundwater criteria of greater than 10-feet below the proposed invert of infiltration based upon the data contained herein. However, as discussed in the attached Geosyntec Technical Memorandum (Geosyntec, 2019), it is expected that during periods of heavy rainfall it

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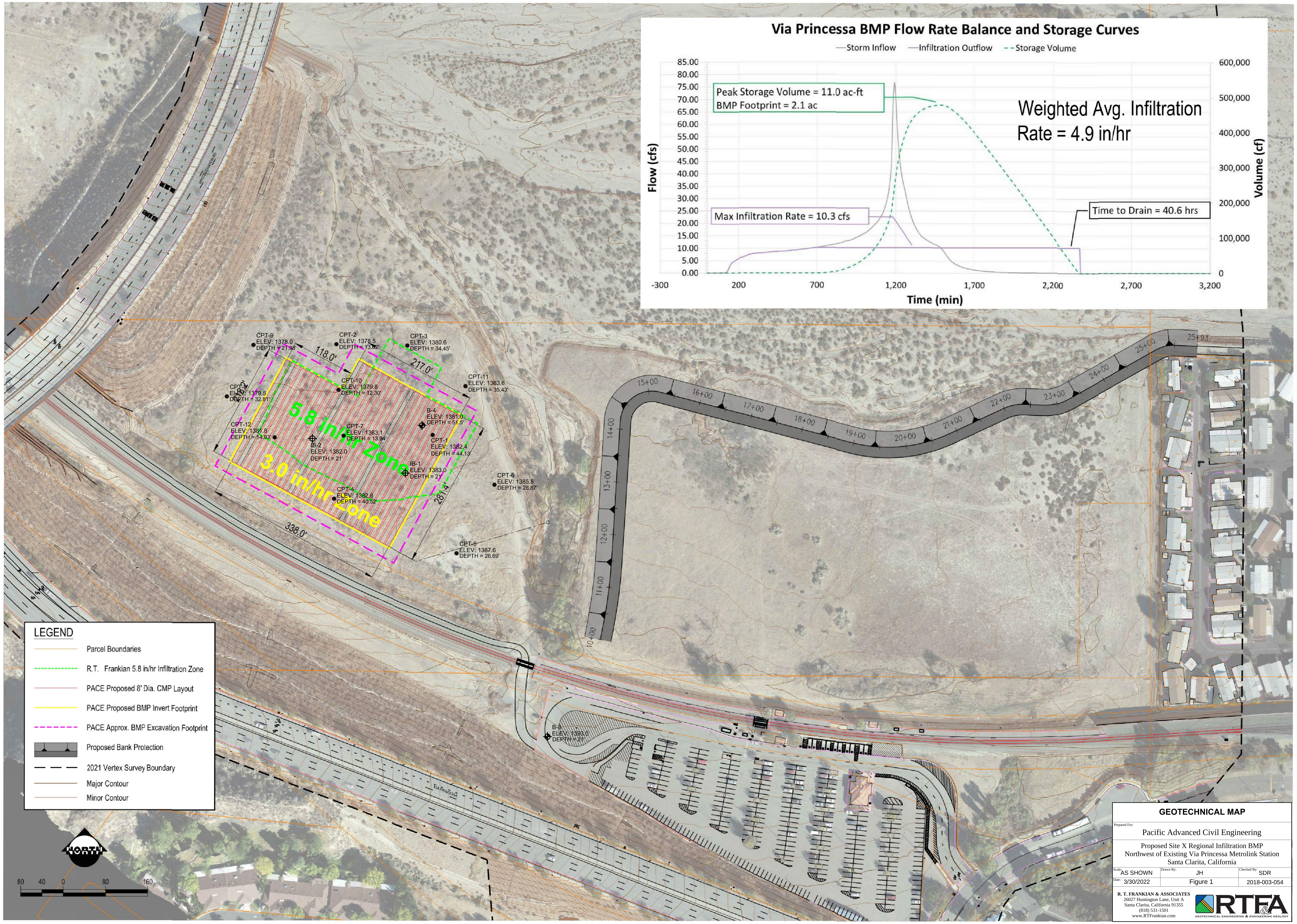

GEOTECHNICAL MAP

Prepared For:

Pacific Advanced Civil Engineering

Proposed Site X Regional Infiltration BMP
Northwest of Existing Via Princessa Metrolink Station
Santa Clarita, California

Scale: AS SHOWN	Drawn By: JH	Checked By: SDR
Date: 3/30/2022	Figure 1	2018-003-054

R. T. FRANKIAN & ASSOCIATES
26027 Huntington Lane, Unit A
Santa Clarita, California 91355
(818) 531-1501
www.RTFrankian.com

GEOTECHNICAL ENGINEERING & ENGINEERING GEOLOGY

NO	BY	DATE	REVISIONS	DATE	APP.

PREPARED BY PACE
PROJECT ENGINEER DUONG DO
R.C.E. NO. --
EXP. x/xx/xx
DRAWN C.T.
DESIGNED C.T.
CHECKED D.D
SCALE 1" = 80'
DATE 02-16-2022

TITLE
PRELIMINARY BMP LAYOUT

JOB
VIA PRINCESSA PARK
REGIONAL INFILTRATION BMP
SANTA CLARITA GA

PACE Advanced Water Engineering
17520 Newhope Street, Suite 200 | Fountain Valley, CA 92708
P: (714) 481-7300 | www.pacewater.com

SHEET 2

JOB NO. B894

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BMP Footprint within 5.8 in/hr zone =	1.44 ac	**Areas and infiltration zones obtained from 'Geotechnical Map, Sheet 2' of R.T. Frankian & associates report dated March 30, 2022*
BMP Footprint within 3 in/hr zone =	0.66 ac	

Weighted Avg. Infiltration Rate = **{[Area 1 x Infiltration Rate 1] + [Area 2 x Infiltration Rate 2]} / Total Area**

Weighted Avg. Infiltration Rate = 4.92 in/hr

PACE
Advanced Water Engineering

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ATTACHMENTS FOR SECTION 3.4:

EVENT-BASED DESIGN DETAILS

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BMP Inflow/Outflow/Storage Analysis

		Flow In			Flow Out			
Period # (5-min periods)	**Time (min)**	**Runoff Flow Rate (cfs)**	**Incremental Vol (cf)**	**Cumulative Vol (cf)**	**Infiltration Flow Rate (cfs)**	**Incremental Vol (cf)**	**Cumulative Vol (cf)**	**Storage Volume (cf)**
1	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	25	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	30	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	40	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	55	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	60	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	65	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	85	0.10	30.00	30.00	0.10	30.00	30.00	0.00
19	90	0.10	30.00	60.00	0.10	30.00	60.00	0.00
20	95	0.10	30.00	90.00	0.10	30.00	90.00	0.00
21	100	0.10	30.00	120.00	0.10	30.00	120.00	0.00
22	105	0.10	30.00	150.00	0.10	30.00	150.00	0.00
23	110	0.10	30.00	180.00	0.10	30.00	180.00	0.00
24	115	0.20	60.00	240.00	0.20	60.00	240.00	0.00
25	120	0.20	60.00	300.00	0.20	60.00	300.00	0.00
26	125	0.40	120.00	420.00	0.40	120.00	420.00	0.00
27	130	0.80	240.00	660.00	0.80	240.00	660.00	0.00
28	135	1.50	450.00	1,110.00	1.50	450.00	1,110.00	0.00
29	140	2.30	690.00	1,800.00	2.30	690.00	1,800.00	0.00
30	145	3.00	900.00	2,700.00	3.00	900.00	2,700.00	0.00
31	150	3.50	1,050.00	3,750.00	3.50	1,050.00	3,750.00	0.00
32	155	4.00	1,200.00	4,950.00	4.00	1,200.00	4,950.00	0.00
33	160	4.20	1,260.00	6,210.00	4.20	1,260.00	6,210.00	0.00
34	165	4.50	1,350.00	7,560.00	4.50	1,350.00	7,560.00	0.00
35	170	4.70	1,410.00	8,970.00	4.70	1,410.00	8,970.00	0.00
36	175	4.90	1,470.00	10,440.00	4.90	1,470.00	10,440.00	0.00
37	180	5.00	1,500.00	11,940.00	5.00	1,500.00	11,940.00	0.00
38	185	5.30	1,590.00	13,530.00	5.30	1,590.00	13,530.00	0.00
39	190	5.50	1,650.00	15,180.00	5.50	1,650.00	15,180.00	0.00
40	195	5.70	1,710.00	16,890.00	5.70	1,710.00	16,890.00	0.00
41	200	5.80	1,740.00	18,630.00	5.80	1,740.00	18,630.00	0.00
42	205	6.00	1,800.00	20,430.00	6.00	1,800.00	20,430.00	0.00
43	210	6.10	1,830.00	22,260.00	6.10	1,830.00	22,260.00	0.00
44	215	6.30	1,890.00	24,150.00	6.30	1,890.00	24,150.00	0.00
45	220	6.40	1,920.00	26,070.00	6.40	1,920.00	26,070.00	0.00
46	225	6.40	1,920.00	27,990.00	6.40	1,920.00	27,990.00	0.00
47	230	6.50	1,950.00	29,940.00	6.50	1,950.00	29,940.00	0.00
48	235	6.70	2,010.00	31,950.00	6.70	2,010.00	31,950.00	0.00
49	240	6.80	2,040.00	33,990.00	6.80	2,040.00	33,990.00	0.00
50	245	6.90	2,070.00	36,060.00	6.90	2,070.00	36,060.00	0.00
51	250	7.10	2,130.00	38,190.00	7.10	2,130.00	38,190.00	0.00
52	255	7.20	2,160.00	40,350.00	7.20	2,160.00	40,350.00	0.00
53	260	7.40	2,220.00	42,570.00	7.40	2,220.00	42,570.00	0.00
54	265	7.50	2,250.00	44,820.00	7.50	2,250.00	44,820.00	0.00
55	270	7.50	2,250.00	47,070.00	7.50	2,250.00	47,070.00	0.00
56	275	7.60	2,280.00	49,350.00	7.60	2,280.00	49,350.00	0.00
57	280	7.70	2,310.00	51,660.00	7.70	2,310.00	51,660.00	0.00
58	285	7.80	2,340.00	54,000.00	7.80	2,340.00	54,000.00	0.00
59	290	7.90	2,370.00	56,370.00	7.90	2,370.00	56,370.00	0.00
60	295	7.90	2,370.00	58,740.00	7.90	2,370.00	58,740.00	0.00
61	300	7.90	2,370.00	61,110.00	7.90	2,370.00	61,110.00	0.00
62	305	7.90	2,370.00	63,480.00	7.90	2,370.00	63,480.00	0.00
63	310	8.00	2,400.00	65,880.00	8.00	2,400.00	65,880.00	0.00
64	315	8.00	2,400.00	68,280.00	8.00	2,400.00	68,280.00	0.00
65	320	8.10	2,430.00	70,710.00	8.10	2,430.00	70,710.00	0.00
66	325	8.10	2,430.00	73,140.00	8.10	2,430.00	73,140.00	0.00
67	330	8.10	2,430.00	75,570.00	8.10	2,430.00	75,570.00	0.00
68	335	8.10	2,430.00	78,000.00	8.10	2,430.00	78,000.00	0.00
69	340	8.10	2,430.00	80,430.00	8.10	2,430.00	80,430.00	0.00
70	345	8.10	2,430.00	82,860.00	8.10	2,430.00	82,860.00	0.00
71	350	8.20	2,460.00	85,320.00	8.20	2,460.00	85,320.00	0.00
72	355	8.20	2,460.00	87,780.00	8.20	2,460.00	87,780.00	0.00
73	360	8.30	2,490.00	90,270.00	8.30	2,490.00	90,270.00	0.00
74	365	8.30	2,490.00	92,760.00	8.30	2,490.00	92,760.00	0.00
75	370	8.30	2,490.00	95,250.00	8.30	2,490.00	95,250.00	0.00
76	375	8.30	2,490.00	97,740.00	8.30	2,490.00	97,740.00	0.00
77	380	8.30	2,490.00	100,230.00	8.30	2,490.00	100,230.00	0.00
78	385	8.40	2,520.00	102,750.00	8.40	2,520.00	102,750.00	0.00
79	390	8.40	2,520.00	105,270.00	8.40	2,520.00	105,270.00	0.00
80	395	8.50	2,550.00	107,820.00	8.50	2,550.00	107,820.00	0.00
81	400	8.50	2,550.00	110,370.00	8.50	2,550.00	110,370.00	0.00
82	405	8.50	2,550.00	112,920.00	8.50	2,550.00	112,920.00	0.00
83	410	8.60	2,580.00	115,500.00	8.60	2,580.00	115,500.00	0.00
84	415	8.60	2,580.00	118,080.00	8.60	2,580.00	118,080.00	0.00
85	420	8.60	2,580.00	120,660.00	8.60	2,580.00	120,660.00	0.00
86	425	8.70	2,610.00	123,270.00	8.70	2,610.00	123,270.00	0.00
87	430	8.70	2,610.00	125,880.00	8.70	2,610.00	125,880.00	0.00
88	435	8.70	2,610.00	128,490.00	8.70	2,610.00	128,490.00	0.00
89	440	8.70	2,610.00	131,100.00	8.70	2,610.00	131,100.00	0.00
90	445	8.70	2,610.00	133,710.00	8.70	2,610.00	133,710.00	0.00
91	450	8.70	2,610.00	136,320.00	8.70	2,610.00	136,320.00	0.00
92	455	8.80	2,640.00	138,960.00	8.80	2,640.00	138,960.00	0.00
93	460	8.80	2,640.00	141,600.00	8.80	2,640.00	141,600.00	0.00
94	465	8.80	2,640.00	144,240.00	8.80	2,640.00	144,240.00	0.00
95	470	8.80	2,640.00	146,880.00	8.80	2,640.00	146,880.00	0.00
96	475	8.80	2,640.00	149,520.00	8.80	2,640.00	149,520.00	0.00
97	480	8.80	2,640.00	152,160.00	8.80	2,640.00	152,160.00	0.00
98	485	8.80	2,640.00	154,800.00	8.80	2,640.00	154,800.00	0.00
99	490	8.80	2,640.00	157,440.00	8.80	2,640.00	157,440.00	0.00
100	495	8.80	2,640.00	160,080.00	8.80	2,640.00	160,080.00	0.00
101	500	8.90	2,670.00	162,750.00	8.90	2,670.00	162,750.00	0.00
102	505	8.90	2,670.00	165,420.00	8.90	2,670.00	165,420.00	0.00
103	510	9.00	2,700.00	168,120.00	9.00	2,700.00	168,120.00	0.00
104	515	9.00	2,700.00	170,820.00	9.00	2,700.00	170,820.00	0.00
105	520	9.00	2,700.00	173,520.00	9.00	2,700.00	173,520.00	0.00
106	525	9.10	2,730.00	176,250.00	9.10	2,730.00	176,250.00	0.00
107	530	9.10	2,730.00	178,980.00	9.10	2,730.00	178,980.00	0.00
108	535	9.10	2,730.00	181,710.00	9.10	2,730.00	181,710.00	0.00
109	540	9.20	2,760.00	184,470.00	9.20	2,760.00	184,470.00	0.00
110	545	9.30	2,790.00	187,260.00	9.30	2,790.00	187,260.00	0.00
111	550	9.30	2,790.00	190,050.00	9.30	2,790.00	190,050.00	0.00
112	555	9.30	2,790.00	192,840.00	9.30	2,790.00	192,840.00	0.00
113	560	9.30	2,790.00	195,630.00	9.30	2,790.00	195,630.00	0.00
114	565	9.30	2,790.00	198,420.00	9.30	2,790.00	198,420.00	0.00
115	570	9.30	2,790.00	201,210.00	9.30	2,790.00	201,210.00	0.00
116	575	9.40	2,820.00	204,030.00	9.40	2,820.00	204,030.00	0.00
117	580	9.50	2,850.00	206,880.00	9.50	2,850.00	206,880.00	0.00
118	585	9.50	2,850.00	209,730.00	9.50	2,850.00	209,730.00	0.00
119	590	9.50	2,850.00	212,580.00	9.50	2,850.00	212,580.00	0.00
120	595	9.60	2,880.00	215,460.00	9.60	2,880.00	215,460.00	0.00
121	600	9.60	2,880.00	218,340.00	9.60	2,880.00	218,340.00	0.00
122	605	9.60	2,880.00	221,220.00	9.60	2,880.00	221,220.00	0.00
123	610	9.70	2,910.00	224,130.00	9.70	2,910.00	224,130.00	0.00
124	615	9.70	2,910.00	227,040.00	9.70	2,910.00	227,040.00	0.00
125	620	9.70	2,910.00	229,950.00	9.70	2,910.00	229,950.00	0.00
126	625	9.80	2,940.00	232,890.00	9.80	2,940.00	232,890.00	0.00
127	630	9.80	2,940.00	235,830.00	9.80	2,940.00	235,830.00	0.00
128	635	9.90	2,970.00	238,800.00	9.90	2,970.00	238,800.00	0.00
129	640	9.90	2,970.00	241,770.00	9.90	2,970.00	241,770.00	0.00
130	645	9.90	2,970.00	244,740.00	9.90	2,970.00	244,740.00	0.00
131	650	10.00	3,000.00	247,740.00	10.00	3,000.00	247,740.00	0.00
132	655	10.00	3,000.00	250,740.00	10.00	3,000.00	250,740.00	0.00

133	660	10.10	3,030.00	253,770.00	10.10	3,030.00	253,770.00	0.00
134	665	10.10	3,030.00	256,800.00	10.10	3,030.00	256,800.00	0.00
135	670	10.10	3,030.00	259,830.00	10.10	3,030.00	259,830.00	0.00
136	675	10.20	3,060.00	262,890.00	10.20	3,060.00	262,890.00	0.00
137	680	10.20	3,060.00	265,950.00	10.20	3,060.00	265,950.00	0.00
138	685	10.30	3,090.00	269,040.00	10.30	3,090.00	269,040.00	0.00
139	690	10.30	3,090.00	272,130.00	10.30	3,090.00	272,130.00	0.00
140	695	10.40	3,120.00	275,250.00	10.32	3,095.20	275,225.20	24.80
141	700	10.40	3,120.00	278,370.00	10.32	3,095.20	278,320.39	49.61
142	705	10.50	3,150.00	281,520.00	10.32	3,095.20	281,415.59	104.41
143	710	10.50	3,150.00	284,670.00	10.32	3,095.20	284,510.79	159.21
144	715	10.60	3,180.00	287,850.00	10.32	3,095.20	287,605.99	244.01
145	720	10.60	3,180.00	291,030.00	10.32	3,095.20	290,701.18	328.82
146	725	10.60	3,180.00	294,210.00	10.32	3,095.20	293,796.38	413.62
147	730	10.70	3,210.00	297,420.00	10.32	3,095.20	296,891.58	528.42
148	735	10.70	3,210.00	300,630.00	10.32	3,095.20	299,986.77	643.23
149	740	10.80	3,240.00	303,870.00	10.32	3,095.20	303,081.97	788.03
150	745	10.90	3,270.00	307,140.00	10.32	3,095.20	306,177.17	962.83
151	750	10.90	3,270.00	310,410.00	10.32	3,095.20	309,272.37	1,137.63
152	755	11.00	3,300.00	313,710.00	10.32	3,095.20	312,367.56	1,342.44
153	760	11.10	3,330.00	317,040.00	10.32	3,095.20	315,462.76	1,577.24
154	765	11.10	3,330.00	320,370.00	10.32	3,095.20	318,557.96	1,812.04
155	770	11.20	3,360.00	323,730.00	10.32	3,095.20	321,653.15	2,076.85
156	775	11.30	3,390.00	327,120.00	10.32	3,095.20	324,748.35	2,371.65
157	780	11.30	3,390.00	330,510.00	10.32	3,095.20	327,843.55	2,666.45
158	785	11.40	3,420.00	333,930.00	10.32	3,095.20	330,938.74	2,991.26
159	790	11.40	3,420.00	337,350.00	10.32	3,095.20	334,033.94	3,316.06
160	795	11.50	3,450.00	340,800.00	10.32	3,095.20	337,129.14	3,670.86
161	800	11.60	3,480.00	344,280.00	10.32	3,095.20	340,224.34	4,055.66
162	805	11.60	3,480.00	347,760.00	10.32	3,095.20	343,319.53	4,440.47
163	810	11.70	3,510.00	351,270.00	10.32	3,095.20	346,414.73	4,855.27
164	815	11.70	3,510.00	354,780.00	10.32	3,095.20	349,509.93	5,270.07
165	820	11.80	3,540.00	358,320.00	10.32	3,095.20	352,605.12	5,714.88
166	825	11.90	3,570.00	361,890.00	10.32	3,095.20	355,700.32	6,189.68
167	830	12.00	3,600.00	365,490.00	10.32	3,095.20	358,795.52	6,694.48
168	835	12.10	3,630.00	369,120.00	10.32	3,095.20	361,890.72	7,229.28
169	840	12.20	3,660.00	372,780.00	10.32	3,095.20	364,985.91	7,794.09
170	845	12.20	3,660.00	376,440.00	10.32	3,095.20	368,081.11	8,358.89
171	850	12.30	3,690.00	380,130.00	10.32	3,095.20	371,176.31	8,953.69
172	855	12.40	3,720.00	383,850.00	10.32	3,095.20	374,271.50	9,578.50
173	860	12.50	3,750.00	387,600.00	10.32	3,095.20	377,366.70	10,233.30
174	865	12.60	3,780.00	391,380.00	10.32	3,095.20	380,461.90	10,918.10
175	870	12.80	3,840.00	395,220.00	10.32	3,095.20	383,557.10	11,662.90
176	875	12.90	3,870.00	399,090.00	10.32	3,095.20	386,652.29	12,437.71
177	880	13.00	3,900.00	402,990.00	10.32	3,095.20	389,747.49	13,242.51
178	885	13.00	3,900.00	406,890.00	10.32	3,095.20	392,842.69	14,047.31
179	890	13.10	3,930.00	410,820.00	10.32	3,095.20	395,937.88	14,882.12
180	895	13.10	3,930.00	414,750.00	10.32	3,095.20	399,033.08	15,716.92
181	900	13.20	3,960.00	418,710.00	10.32	3,095.20	402,128.28	16,581.72
182	905	13.30	3,990.00	422,700.00	10.32	3,095.20	405,223.48	17,476.52
183	910	13.40	4,020.00	426,720.00	10.32	3,095.20	408,318.67	18,401.33
184	915	13.50	4,050.00	430,770.00	10.32	3,095.20	411,413.87	19,356.13
185	920	13.60	4,080.00	434,850.00	10.32	3,095.20	414,509.07	20,340.93
186	925	13.70	4,110.00	438,960.00	10.32	3,095.20	417,604.26	21,355.74
187	930	13.90	4,170.00	443,130.00	10.32	3,095.20	420,699.46	22,430.54
188	935	14.00	4,200.00	447,330.00	10.32	3,095.20	423,794.66	23,535.34
189	940	14.20	4,260.00	451,590.00	10.32	3,095.20	426,889.86	24,700.14
190	945	14.30	4,290.00	455,880.00	10.32	3,095.20	429,985.05	25,894.95
191	950	14.50	4,350.00	460,230.00	10.32	3,095.20	433,080.25	27,149.75
192	955	14.60	4,380.00	464,610.00	10.32	3,095.20	436,175.45	28,434.55
193	960	14.80	4,440.00	469,050.00	10.32	3,095.20	439,270.64	29,779.36
194	965	14.90	4,470.00	473,520.00	10.32	3,095.20	442,365.84	31,154.16
195	970	15.00	4,500.00	478,020.00	10.32	3,095.20	445,461.04	32,558.96
196	975	15.20	4,560.00	482,580.00	10.32	3,095.20	448,556.23	34,023.77
197	980	15.30	4,590.00	487,170.00	10.32	3,095.20	451,651.43	35,518.57
198	985	15.50	4,650.00	491,820.00	10.32	3,095.20	454,746.63	37,073.37
199	990	15.70	4,710.00	496,530.00	10.32	3,095.20	457,841.83	38,688.17
200	995	15.80	4,740.00	501,270.00	10.32	3,095.20	460,937.02	40,332.98
201	1000	16.00	4,800.00	506,070.00	10.32	3,095.20	464,032.22	42,037.78
202	1005	16.10	4,830.00	510,900.00	10.32	3,095.20	467,127.42	43,772.58
203	1010	16.30	4,890.00	515,790.00	10.32	3,095.20	470,222.61	45,567.39
204	1015	16.60	4,980.00	520,770.00	10.32	3,095.20	473,317.81	47,452.19
205	1020	16.80	5,040.00	525,810.00	10.32	3,095.20	476,413.01	49,396.99
206	1025	17.00	5,100.00	530,910.00	10.32	3,095.20	479,508.21	51,401.79
207	1030	17.30	5,190.00	536,100.00	10.32	3,095.20	482,603.40	53,496.60
208	1035	17.60	5,280.00	541,380.00	10.32	3,095.20	485,698.60	55,681.40
209	1040	17.90	5,370.00	546,750.00	10.32	3,095.20	488,793.80	57,956.20
210	1045	18.10	5,430.00	552,180.00	10.32	3,095.20	491,888.99	60,291.01
211	1050	18.50	5,550.00	557,730.00	10.32	3,095.20	494,984.19	62,745.81
212	1055	18.80	5,640.00	563,370.00	10.32	3,095.20	498,079.39	65,290.61
213	1060	19.10	5,730.00	569,100.00	10.32	3,095.20	501,174.59	67,925.41
214	1065	19.40	5,820.00	574,920.00	10.32	3,095.20	504,269.78	70,650.22
215	1070	19.70	5,910.00	580,830.00	10.32	3,095.20	507,364.98	73,465.02
216	1075	20.10	6,030.00	586,860.00	10.32	3,095.20	510,460.18	76,399.82
217	1080	20.50	6,150.00	593,010.00	10.32	3,095.20	513,555.37	79,454.63
218	1085	20.80	6,240.00	599,250.00	10.32	3,095.20	516,650.57	82,599.43
219	1090	21.30	6,390.00	605,640.00	10.32	3,095.20	519,745.77	85,894.23
220	1095	21.70	6,510.00	612,150.00	10.32	3,095.20	522,840.97	89,309.03
221	1100	22.30	6,690.00	618,840.00	10.32	3,095.20	525,936.16	92,903.84
222	1105	22.80	6,840.00	625,680.00	10.32	3,095.20	529,031.36	96,648.64
223	1110	23.30	6,990.00	632,670.00	10.32	3,095.20	532,126.56	100,543.44
224	1115	23.90	7,170.00	639,840.00	10.32	3,095.20	535,221.75	104,618.25
225	1120	24.70	7,410.00	647,250.00	10.32	3,095.20	538,316.95	108,933.05
226	1125	25.50	7,650.00	654,900.00	10.32	3,095.20	541,412.15	113,487.85
227	1130	26.50	7,950.00	662,850.00	10.32	3,095.20	544,507.34	118,342.66
228	1135	27.50	8,250.00	671,100.00	10.32	3,095.20	547,602.54	123,497.46
229	1140	28.60	8,580.00	679,680.00	10.32	3,095.20	550,697.74	128,982.26
230	1145	30.00	9,000.00	688,680.00	10.32	3,095.20	553,792.94	134,887.06
231	1150	31.40	9,420.00	698,100.00	10.32	3,095.20	556,888.13	141,211.87
232	1155	33.40	10,020.00	708,120.00	10.32	3,095.20	559,983.33	148,136.67
233	1160	36.20	10,860.00	718,980.00	10.32	3,095.20	563,078.53	155,901.47
234	1165	38.40	11,520.00	730,500.00	10.32	3,095.20	566,173.72	164,326.28
235	1170	42.40	12,720.00	743,220.00	10.32	3,095.20	569,268.92	173,951.08
236	1175	52.00	15,600.00	758,820.00	10.32	3,095.20	572,364.12	186,455.88
237	1180	64.20	19,260.00	778,080.00	10.32	3,095.20	575,459.32	202,620.68
238	1185	72.90	21,870.00	799,950.00	10.32	3,095.20	578,554.51	221,395.49
239	1190	76.90	23,070.00	823,020.00	10.32	3,095.20	581,649.71	241,370.29
240	1195	74.80	22,440.00	845,460.00	10.32	3,095.20	584,744.91	260,715.09
241	1200	68.70	20,610.00	866,070.00	10.32	3,095.20	587,840.10	278,229.90
242	1205	62.20	18,660.00	884,730.00	10.32	3,095.20	590,935.30	293,794.70
243	1210	56.70	17,010.00	901,740.00	10.32	3,095.20	594,030.50	307,709.50
244	1215	52.10	15,630.00	917,370.00	10.32	3,095.20	597,125.70	320,244.30
245	1220	48.40	14,520.00	931,890.00	10.32	3,095.20	600,220.89	331,669.11
246	1225	45.20	13,560.00	945,450.00	10.32	3,095.20	603,316.09	342,133.91
247	1230	42.50	12,750.00	958,200.00	10.32	3,095.20	606,411.29	351,788.71
248	1235	40.10	12,030.00	970,230.00	10.32	3,095.20	609,506.48	360,723.52
249	1240	38.10	11,430.00	981,660.00	10.32	3,095.20	612,601.68	369,058.32
250	1245	36.50	10,950.00	992,610.00	10.32	3,095.20	615,696.88	376,913.12
251	1250	35.20	10,560.00	1,003,170.00	10.32	3,095.20	618,792.08	384,377.92
252	1255	33.90	10,170.00	1,013,340.00	10.32	3,095.20	621,887.27	391,452.73
253	1260	32.50	9,750.00	1,023,090.00	10.32	3,095.20	624,982.47	398,107.53
254	1265	30.90	9,270.00	1,032,360.00	10.32	3,095.20	628,077.67	404,282.33
255	1270	29.40	8,820.00	1,041,180.00	10.32	3,095.20	631,172.86	410,007.14
256	1275	27.90	8,370.00	1,049,550.00	10.32	3,095.20	634,268.06	415,281.94
257	1280	26.50	7,950.00	1,057,500.00	10.32	3,095.20	637,363.26	420,136.74
258	1285	25.30	7,590.00	1,065,090.00	10.32	3,095.20	640,458.45	424,631.55
259	1290	24.10	7,230.00	1,072,320.00	10.32	3,095.20	643,553.65	428,766.35
260	1295	23.10	6,930.00	1,079,250.00	10.32	3,095.20	646,648.85	432,601.15
261	1300	22.10	6,630.00	1,085,880.00	10.32	3,095.20	649,744.05	436,135.95
262	1305	21.20	6,360.00	1,092,240.00	10.32	3,095.20	652,839.24	439,400.76
263	1310	20.40	6,120.00	1,098,360.00	10.32	3,095.20	655,934.44	442,425.56
264	1315	19.70	5,910.00	1,104,270.00	10.32	3,095.20	659,029.64	445,240.36
265	1320	19.00	5,700.00	1,109,970.00	10.32	3,095.20	662,124.83	447,845.17
266	1325	18.30	5,490.00	1,115,460.00	10.32	3,095.20	665,220.03	450,239.97

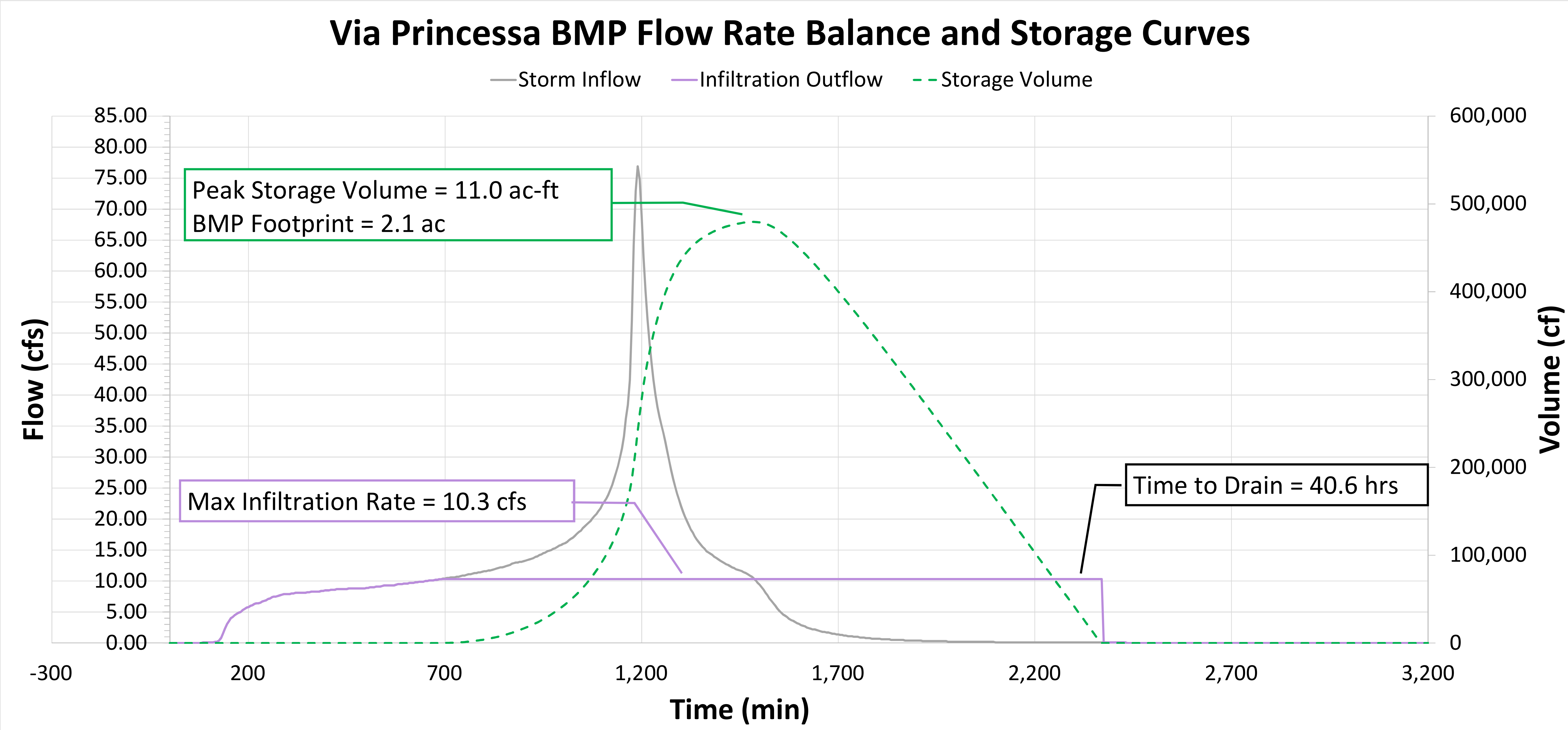
267	1330	17.80	5,340.00	1,120,800.00	10.32	3,095.20	668,315.23	452,484.77
268	1335	17.20	5,160.00	1,125,960.00	10.32	3,095.20	671,410.43	454,549.57
269	1340	16.70	5,010.00	1,130,970.00	10.32	3,095.20	674,505.62	456,464.38
270	1345	16.30	4,890.00	1,135,860.00	10.32	3,095.20	677,600.82	458,259.18
271	1350	15.90	4,770.00	1,140,630.00	10.32	3,095.20	680,696.02	459,933.98
272	1355	15.50	4,650.00	1,145,280.00	10.32	3,095.20	683,791.21	461,488.79
273	1360	15.20	4,560.00	1,149,840.00	10.32	3,095.20	686,886.41	462,953.59
274	1365	14.80	4,440.00	1,154,280.00	10.32	3,095.20	689,981.61	464,298.39
275	1370	14.60	4,380.00	1,158,660.00	10.32	3,095.20	693,076.81	465,583.19
276	1375	14.40	4,320.00	1,162,980.00	10.32	3,095.20	696,172.00	466,808.00
277	1380	14.20	4,260.00	1,167,240.00	10.32	3,095.20	699,267.20	467,972.80
278	1385	13.90	4,170.00	1,171,410.00	10.32	3,095.20	702,362.40	469,047.60
279	1390	13.70	4,110.00	1,175,520.00	10.32	3,095.20	705,457.59	470,062.41
280	1395	13.50	4,050.00	1,179,570.00	10.32	3,095.20	708,552.79	471,017.21
281	1400	13.30	3,990.00	1,183,560.00	10.32	3,095.20	711,647.99	471,912.01
282	1405	13.10	3,930.00	1,187,490.00	10.32	3,095.20	714,743.19	472,746.81
283	1410	12.90	3,870.00	1,191,360.00	10.32	3,095.20	717,838.38	473,521.62
284	1415	12.70	3,810.00	1,195,170.00	10.32	3,095.20	720,933.58	474,236.42
285	1420	12.60	3,780.00	1,198,950.00	10.32	3,095.20	724,028.78	474,921.22
286	1425	12.40	3,720.00	1,202,670.00	10.32	3,095.20	727,123.97	475,546.03
287	1430	12.20	3,660.00	1,206,330.00	10.32	3,095.20	730,219.17	476,110.83
288	1435	12.10	3,630.00	1,209,960.00	10.32	3,095.20	733,314.37	476,645.63
289	1440	11.90	3,570.00	1,213,530.00	10.32	3,095.20	736,409.57	477,120.43
290	1445	11.80	3,540.00	1,217,070.00	10.32	3,095.20	739,504.76	477,565.24
291	1450	11.70	3,510.00	1,220,580.00	10.32	3,095.20	742,599.96	477,980.04
292	1455	11.60	3,480.00	1,224,060.00	10.32	3,095.20	745,695.16	478,364.84
293	1460	11.40	3,420.00	1,227,480.00	10.32	3,095.20	748,790.35	478,689.65
294	1465	11.30	3,390.00	1,230,870.00	10.32	3,095.20	751,885.55	478,984.45
295	1470	11.10	3,330.00	1,234,200.00	10.32	3,095.20	754,980.75	479,219.25
296	1475	10.90	3,270.00	1,237,470.00	10.32	3,095.20	758,075.94	479,394.06
297	1480	10.70	3,210.00	1,240,680.00	10.32	3,095.20	761,171.14	479,508.86
298	1485	10.40	3,120.00	1,243,800.00	10.32	3,095.20	764,266.34	479,533.66
299	1490	10.10	3,030.00	1,246,830.00	10.32	3,095.20	767,361.54	479,468.46
300	1495	9.70	2,910.00	1,249,740.00	10.32	3,095.20	770,456.73	479,283.27
301	1500	9.40	2,820.00	1,252,560.00	10.32	3,095.20	773,551.93	479,008.07
302	1505	9.00	2,700.00	1,255,260.00	10.32	3,095.20	776,647.13	478,612.87
303	1510	8.60	2,580.00	1,257,840.00	10.32	3,095.20	779,742.32	478,097.68
304	1515	8.10	2,430.00	1,260,270.00	10.32	3,095.20	782,837.52	477,432.48
305	1520	7.70	2,310.00	1,262,580.00	10.32	3,095.20	785,932.72	476,647.28
306	1525	7.20	2,160.00	1,264,740.00	10.32	3,095.20	789,027.92	475,712.08
307	1530	6.80	2,040.00	1,266,780.00	10.32	3,095.20	792,123.11	474,656.89
308	1535	6.40	1,920.00	1,268,700.00	10.32	3,095.20	795,218.31	473,481.69
309	1540	6.00	1,800.00	1,270,500.00	10.32	3,095.20	798,313.51	472,186.49
310	1545	5.60	1,680.00	1,272,180.00	10.32	3,095.20	801,408.70	470,771.30
311	1550	5.20	1,560.00	1,273,740.00	10.32	3,095.20	804,503.90	469,236.10
312	1555	4.90	1,470.00	1,275,210.00	10.32	3,095.20	807,599.10	467,610.90
313	1560	4.60	1,380.00	1,276,590.00	10.32	3,095.20	810,694.30	465,895.70
314	1565	4.40	1,320.00	1,277,910.00	10.32	3,095.20	813,789.49	464,120.51
315	1570	4.20	1,260.00	1,279,170.00	10.32	3,095.20	816,884.69	462,285.31
316	1575	3.90	1,170.00	1,280,340.00	10.32	3,095.20	819,979.89	460,360.11
317	1580	3.70	1,110.00	1,281,450.00	10.32	3,095.20	823,075.08	458,374.92
318	1585	3.60	1,080.00	1,282,530.00	10.32	3,095.20	826,170.28	456,359.72
319	1590	3.40	1,020.00	1,283,550.00	10.32	3,095.20	829,265.48	454,284.52
320	1595	3.20	960.00	1,284,510.00	10.32	3,095.20	832,360.68	452,149.32
321	1600	3.10	930.00	1,285,440.00	10.32	3,095.20	835,455.87	449,984.13
322	1605	2.90	870.00	1,286,310.00	10.32	3,095.20	838,551.07	447,758.93
323	1610	2.80	840.00	1,287,150.00	10.32	3,095.20	841,646.27	445,503.73
324	1615	2.70	810.00	1,287,960.00	10.32	3,095.20	844,741.46	443,218.54
325	1620	2.50	750.00	1,288,710.00	10.32	3,095.20	847,836.66	440,873.34
326	1625	2.40	720.00	1,289,430.00	10.32	3,095.20	850,931.86	438,498.14
327	1630	2.30	690.00	1,290,120.00	10.32	3,095.20	854,027.05	436,092.95
328	1635	2.20	660.00	1,290,780.00	10.32	3,095.20	857,122.25	433,657.75
329	1640	2.20	660.00	1,291,440.00	10.32	3,095.20	860,217.45	431,222.55
330	1645	2.10	630.00	1,292,070.00	10.32	3,095.20	863,312.65	428,757.35
331	1650	2.00	600.00	1,292,670.00	10.32	3,095.20	866,407.84	426,262.16
332	1655	1.90	570.00	1,293,240.00	10.32	3,095.20	869,503.04	423,736.96
333	1660	1.80	540.00	1,293,780.00	10.32	3,095.20	872,598.24	421,181.76
334	1665	1.80	540.00	1,294,320.00	10.32	3,095.20	875,693.43	418,626.57
335	1670	1.70	510.00	1,294,830.00	10.32	3,095.20	878,788.63	416,041.37
336	1675	1.70	510.00	1,295,340.00	10.32	3,095.20	881,883.83	413,456.17
337	1680	1.60	480.00	1,295,820.00	10.32	3,095.20	884,979.03	410,840.97
338	1685	1.50	450.00	1,296,270.00	10.32	3,095.20	888,074.22	408,195.78
339	1690	1.50	450.00	1,296,720.00	10.32	3,095.20	891,169.42	405,550.58
340	1695	1.40	420.00	1,297,140.00	10.32	3,095.20	894,264.62	402,875.38
341	1700	1.40	420.00	1,297,560.00	10.32	3,095.20	897,359.81	400,200.19
342	1705	1.30	390.00	1,297,950.00	10.32	3,095.20	900,455.01	397,494.99
343	1710	1.30	390.00	1,298,340.00	10.32	3,095.20	903,550.21	394,789.79
344	1715	1.20	360.00	1,298,700.00	10.32	3,095.20	906,645.41	392,054.59
345	1720	1.20	360.00	1,299,060.00	10.32	3,095.20	909,740.60	389,319.40
346	1725	1.10	330.00	1,299,390.00	10.32	3,095.20	912,835.80	386,554.20
347	1730	1.10	330.00	1,299,720.00	10.32	3,095.20	915,931.00	383,789.00
348	1735	1.10	330.00	1,300,050.00	10.32	3,095.20	919,026.19	381,023.81
349	1740	1.00	300.00	1,300,350.00	10.32	3,095.20	922,121.39	378,228.61
350	1745	1.00	300.00	1,300,650.00	10.32	3,095.20	925,216.59	375,433.41
351	1750	1.00	300.00	1,300,950.00	10.32	3,095.20	928,311.79	372,638.21
352	1755	0.90	270.00	1,301,220.00	10.32	3,095.20	931,406.98	369,813.02
353	1760	0.90	270.00	1,301,490.00	10.32	3,095.20	934,502.18	366,987.82
354	1765	0.90	270.00	1,301,760.00	10.32	3,095.20	937,597.38	364,162.62
355	1770	0.80	240.00	1,302,000.00	10.32	3,095.20	940,692.57	361,307.43
356	1775	0.80	240.00	1,302,240.00	10.32	3,095.20	943,787.77	358,452.23
357	1780	0.80	240.00	1,302,480.00	10.32	3,095.20	946,882.97	355,597.03
358	1785	0.70	210.00	1,302,690.00	10.32	3,095.20	949,978.16	352,711.84
359	1790	0.70	210.00	1,302,900.00	10.32	3,095.20	953,073.36	349,826.64
360	1795	0.70	210.00	1,303,110.00	10.32	3,095.20	956,168.56	346,941.44
361	1800	0.70	210.00	1,303,320.00	10.32	3,095.20	959,263.76	344,056.24
362	1805	0.70	210.00	1,303,530.00	10.32	3,095.20	962,358.95	341,171.05
363	1810	0.60	180.00	1,303,710.00	10.32	3,095.20	965,454.15	338,255.85
364	1815	0.60	180.00	1,303,890.00	10.32	3,095.20	968,549.35	335,340.65
365	1820	0.60	180.00	1,304,070.00	10.32	3,095.20	971,644.54	332,425.46
366	1825	0.60	180.00	1,304,250.00	10.32	3,095.20	974,739.74	329,510.26
367	1830	0.60	180.00	1,304,430.00	10.32	3,095.20	977,834.94	326,595.06
368	1835	0.50	150.00	1,304,580.00	10.32	3,095.20	980,930.14	323,649.86
369	1840	0.50	150.00	1,304,730.00	10.32	3,095.20	984,025.33	320,704.67
370	1845	0.50	150.00	1,304,880.00	10.32	3,095.20	987,120.53	317,759.47
371	1850	0.50	150.00	1,305,030.00	10.32	3,095.20	990,215.73	314,814.27
372	1855	0.50	150.00	1,305,180.00	10.32	3,095.20	993,310.92	311,869.08
373	1860	0.50	150.00	1,305,330.00	10.32	3,095.20	996,406.12	308,923.88
374	1865	0.50	150.00	1,305,480.00	10.32	3,095.20	999,501.32	305,978.68
375	1870	0.40	120.00	1,305,600.00	10.32	3,095.20	1,002,596.52	303,003.48
376	1875	0.40	120.00	1,305,720.00	10.32	3,095.20	1,005,691.71	300,028.29
377	1880	0.40	120.00	1,305,840.00	10.32	3,095.20	1,008,786.91	297,053.09
378	1885	0.40	120.00	1,305,960.00	10.32	3,095.20	1,011,882.11	294,077.89
379	1890	0.40	120.00	1,306,080.00	10.32	3,095.20	1,014,977.30	291,102.70
380	1895	0.40	120.00	1,306,200.00	10.32	3,095.20	1,018,072.50	288,127.50
381	1900	0.40	120.00	1,306,320.00	10.32	3,095.20	1,021,167.70	285,152.30
382	1905	0.40	120.00	1,306,440.00	10.32	3,095.20	1,024,262.90	282,177.10
383	1910	0.40	120.00	1,306,560.00	10.32	3,095.20	1,027,358.09	279,201.91
384	1915	0.30	90.00	1,306,650.00	10.32	3,095.20	1,030,453.29	276,196.71
385	1920	0.30	90.00	1,306,740.00	10.32	3,095.20	1,033,548.49	273,191.51
386	1925	0.30	90.00	1,306,830.00	10.32	3,095.20	1,036,643.68	270,186.32
387	1930	0.30	90.00	1,306,920.00	10.32	3,095.20	1,039,738.88	267,181.12
388	1935	0.30	90.00	1,307,010.00	10.32	3,095.20	1,042,834.08	264,175.92
389	1940	0.30	90.00	1,307,100.00	10.32	3,095.20	1,045,929.28	261,170.72
390	1945	0.30	90.00	1,307,190.00	10.32	3,095.20	1,049,024.47	258,165.53
391	1950	0.30	90.00	1,307,280.00	10.32	3,095.20	1,052,119.67	255,160.33
392	1955	0.30	90.00	1,307,370.00	10.32	3,095.20	1,055,214.87	252,155.13
393	1960	0.30	90.00	1,307,460.00	10.32	3,095.20	1,058,310.06	249,149.94
394	1965	0.30	90.00	1,307,550.00	10.32	3,095.20	1,061,405.26	246,144.74
395	1970	0.30	90.00	1,307,640.00	10.32	3,095.20	1,064,500.46	243,139.54
396	1975	0.30	90.00	1,307,730.00	10.32	3,095.20	1,067,595.65	240,134.35
397	1980	0.20	60.00	1,307,790.00	10.32	3,095.20	1,070,690.85	237,099.15
398	1985	0.20	60.00	1,307,850.00	10.32	3,095.20	1,073,786.05	234,063.95
399	1990	0.20	60.00	1,307,910.00	10.32	3,095.20	1,076,881.25	231,028.75
400	1995	0.20	60.00	1,307,970.00	10.32	3,095.20	1,079,976.44	227,993.56

401	2000	0.20	60.00	1,308,030.00	10.32	3,095.20	1,083,071.64	224,958.36
402	2005	0.20	60.00	1,308,090.00	10.32	3,095.20	1,086,166.84	221,923.16
403	2010	0.20	60.00	1,308,150.00	10.32	3,095.20	1,089,262.03	218,887.97
404	2015	0.20	60.00	1,308,210.00	10.32	3,095.20	1,092,357.23	215,852.77
405	2020	0.20	60.00	1,308,270.00	10.32	3,095.20	1,095,452.43	212,817.57
406	2025	0.20	60.00	1,308,330.00	10.32	3,095.20	1,098,547.63	209,782.37
407	2030	0.20	60.00	1,308,390.00	10.32	3,095.20	1,101,642.82	206,747.18
408	2035	0.20	60.00	1,308,450.00	10.32	3,095.20	1,104,738.02	203,711.98
409	2040	0.20	60.00	1,308,510.00	10.32	3,095.20	1,107,833.22	200,676.78
410	2045	0.20	60.00	1,308,570.00	10.32	3,095.20	1,110,928.41	197,641.59
411	2050	0.20	60.00	1,308,630.00	10.32	3,095.20	1,114,023.61	194,606.39
412	2055	0.20	60.00	1,308,690.00	10.32	3,095.20	1,117,118.81	191,571.19
413	2060	0.20	60.00	1,308,750.00	10.32	3,095.20	1,120,214.01	188,535.99
414	2065	0.20	60.00	1,308,810.00	10.32	3,095.20	1,123,309.20	185,500.80
415	2070	0.20	60.00	1,308,870.00	10.32	3,095.20	1,126,404.40	182,465.60
416	2075	0.20	60.00	1,308,930.00	10.32	3,095.20	1,129,499.60	179,430.40
417	2080	0.20	60.00	1,308,990.00	10.32	3,095.20	1,132,594.79	176,395.21
418	2085	0.20	60.00	1,309,050.00	10.32	3,095.20	1,135,689.99	173,360.01
419	2090	0.20	60.00	1,309,110.00	10.32	3,095.20	1,138,785.19	170,324.81
420	2095	0.20	60.00	1,309,170.00	10.32	3,095.20	1,141,880.39	167,289.61
421	2100	0.10	30.00	1,309,200.00	10.32	3,095.20	1,144,975.58	164,224.42
422	2105	0.10	30.00	1,309,230.00	10.32	3,095.20	1,148,070.78	161,159.22
423	2110	0.10	30.00	1,309,260.00	10.32	3,095.20	1,151,165.98	158,094.02
424	2115	0.10	30.00	1,309,290.00	10.32	3,095.20	1,154,261.17	155,028.83
425	2120	0.10	30.00	1,309,320.00	10.32	3,095.20	1,157,356.37	151,963.63
426	2125	0.10	30.00	1,309,350.00	10.32	3,095.20	1,160,451.57	148,898.43
427	2130	0.10	30.00	1,309,380.00	10.32	3,095.20	1,163,546.76	145,833.24
428	2135	0.10	30.00	1,309,410.00	10.32	3,095.20	1,166,641.96	142,768.04
429	2140	0.10	30.00	1,309,440.00	10.32	3,095.20	1,169,737.16	139,702.84
430	2145	0.10	30.00	1,309,470.00	10.32	3,095.20	1,172,832.36	136,637.64
431	2150	0.10	30.00	1,309,500.00	10.32	3,095.20	1,175,927.55	133,572.45
432	2155	0.10	30.00	1,309,530.00	10.32	3,095.20	1,179,022.75	130,507.25
433	2160	0.10	30.00	1,309,560.00	10.32	3,095.20	1,182,117.95	127,442.05
434	2165	0.10	30.00	1,309,590.00	10.32	3,095.20	1,185,213.14	124,376.86
435	2170	0.10	30.00	1,309,620.00	10.32	3,095.20	1,188,308.34	121,311.66
436	2175	0.10	30.00	1,309,650.00	10.32	3,095.20	1,191,403.54	118,246.46
437	2180	0.10	30.00	1,309,680.00	10.32	3,095.20	1,194,498.74	115,181.26
438	2185	0.10	30.00	1,309,710.00	10.32	3,095.20	1,197,593.93	112,116.07
439	2190	0.10	30.00	1,309,740.00	10.32	3,095.20	1,200,689.13	109,050.87
440	2195	0.10	30.00	1,309,770.00	10.32	3,095.20	1,203,784.33	105,985.67
441	2200	0.10	30.00	1,309,800.00	10.32	3,095.20	1,206,879.52	102,920.48
442	2205	0.10	30.00	1,309,830.00	10.32	3,095.20	1,209,974.72	99,855.28
443	2210	0.10	30.00	1,309,860.00	10.32	3,095.20	1,213,069.92	96,790.08
444	2215	0.10	30.00	1,309,890.00	10.32	3,095.20	1,216,165.12	93,724.88
445	2220	0.10	30.00	1,309,920.00	10.32	3,095.20	1,219,260.31	90,659.69
446	2225	0.10	30.00	1,309,950.00	10.32	3,095.20	1,222,355.51	87,594.49
447	2230	0.10	30.00	1,309,980.00	10.32	3,095.20	1,225,450.71	84,529.29
448	2235	0.10	30.00	1,310,010.00	10.32	3,095.20	1,228,545.90	81,464.10
449	2240	0.10	30.00	1,310,040.00	10.32	3,095.20	1,231,641.10	78,398.90
450	2245	0.10	30.00	1,310,070.00	10.32	3,095.20	1,234,736.30	75,333.70
451	2250	0.10	30.00	1,310,100.00	10.32	3,095.20	1,237,831.50	72,268.50
452	2255	0.10	30.00	1,310,130.00	10.32	3,095.20	1,240,926.69	69,203.31
453	2260	0.10	30.00	1,310,160.00	10.32	3,095.20	1,244,021.89	66,138.11
454	2265	0.10	30.00	1,310,190.00	10.32	3,095.20	1,247,117.09	63,072.91
455	2270	0.10	30.00	1,310,220.00	10.32	3,095.20	1,250,212.28	60,007.72
456	2275	0.10	30.00	1,310,250.00	10.32	3,095.20	1,253,307.48	56,942.52
457	2280	0.10	30.00	1,310,280.00	10.32	3,095.20	1,256,402.68	53,877.32
458	2285	0.10	30.00	1,310,310.00	10.32	3,095.20	1,259,497.88	50,812.12
459	2290	0.10	30.00	1,310,340.00	10.32	3,095.20	1,262,593.07	47,746.93
460	2295	0.10	30.00	1,310,370.00	10.32	3,095.20	1,265,688.27	44,681.73
461	2300	0.10	30.00	1,310,400.00	10.32	3,095.20	1,268,783.47	41,616.53
462	2305	0.10	30.00	1,310,430.00	10.32	3,095.20	1,271,878.66	38,551.34
463	2310	0.10	30.00	1,310,460.00	10.32	3,095.20	1,274,973.86	35,486.14
464	2315	0.10	30.00	1,310,490.00	10.32	3,095.20	1,278,069.06	32,420.94
465	2320	0.10	30.00	1,310,520.00	10.32	3,095.20	1,281,164.25	29,355.75
466	2325	0.10	30.00	1,310,550.00	10.32	3,095.20	1,284,259.45	26,290.55
467	2330	0.10	30.00	1,310,580.00	10.32	3,095.20	1,287,354.65	23,225.35
468	2335	0.10	30.00	1,310,610.00	10.32	3,095.20	1,290,449.85	20,160.15
469	2340	0.10	30.00	1,310,640.00	10.32	3,095.20	1,293,545.04	17,094.96
470	2345	0.10	30.00	1,310,670.00	10.32	3,095.20	1,296,640.24	14,029.76
471	2350	0.10	30.00	1,310,700.00	10.32	3,095.20	1,299,735.44	10,964.56
472	2355	0.10	30.00	1,310,730.00	10.32	3,095.20	1,302,830.63	7,899.37
473	2360	0.10	30.00	1,310,760.00	10.32	3,095.20	1,305,925.83	4,834.17
474	2365	0.10	30.00	1,310,790.00	10.32	3,095.20	1,309,021.03	1,768.97
475	2370	0.10	30.00	1,310,820.00	10.32	3,095.20	1,312,116.23	0.00
476	2375	0.10	30.00	1,310,850.00	0.10	30.00	1,312,146.23	0.00
477	2380	0.10	30.00	1,310,880.00	0.10	30.00	1,312,176.23	0.00
478	2385	0.10	30.00	1,310,910.00	0.10	30.00	1,312,206.23	0.00
479	2390	0.10	30.00	1,310,940.00	0.10	30.00	1,312,236.23	0.00
480	2395	0.10	30.00	1,310,970.00	0.10	30.00	1,312,266.23	0.00
481	2400	0.10	30.00	1,311,000.00	0.10	30.00	1,312,296.23	0.00
482	2405	0.10	30.00	1,311,030.00	0.10	30.00	1,312,326.23	0.00
483	2410	0.10	30.00	1,311,060.00	0.10	30.00	1,312,356.23	0.00
484	2415	0.10	30.00	1,311,090.00	0.10	30.00	1,312,386.23	0.00
485	2420	0.10	30.00	1,311,120.00	0.10	30.00	1,312,416.23	0.00
486	2425	0.10	30.00	1,311,150.00	0.10	30.00	1,312,446.23	0.00
487	2430	0.10	30.00	1,311,180.00	0.10	30.00	1,312,476.23	0.00
488	2435	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
489	2440	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
490	2445	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
491	2450	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
492	2455	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
493	2460	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
494	2465	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
495	2470	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
496	2475	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
497	2480	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
498	2485	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
499	2490	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
500	2495	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
501	2500	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
502	2505	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
503	2510	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
504	2515	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
505	2520	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
506	2525	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
507	2530	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
508	2535	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
509	2540	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
510	2545	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
511	2550	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
512	2555	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
513	2560	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
514	2565	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
515	2570	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
516	2575	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
517	2580	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
518	2585	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
519	2590	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
520	2595	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
521	2600	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
522	2605	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
523	2610	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
524	2615	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
525	2620	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
526	2625	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
527	2630	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
528	2635	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
529	2640	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
530	2645	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
531	2650	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
532	2655	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
533	2660	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
534	2665	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00

535	2670	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
536	2675	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
537	2680	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
538	2685	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
539	2690	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
540	2695	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
541	2700	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
542	2705	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
543	2710	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
544	2715	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
545	2720	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
546	2725	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
547	2730	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
548	2735	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
549	2740	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
550	2745	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
551	2750	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
552	2755	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
553	2760	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
554	2765	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
555	2770	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
556	2775	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
557	2780	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
558	2785	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
559	2790	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
560	2795	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
561	2800	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
562	2805	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
563	2810	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
564	2815	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
565	2820	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
566	2825	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
567	2830	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
568	2835	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
569	2840	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
570	2845	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
571	2850	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
572	2855	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
573	2860	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
574	2865	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
575	2870	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
576	2875	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
577	2880	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
578	2885	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
579	2890	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
580	2895	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
581	2900	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
582	2905	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
583	2910	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
584	2915	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
585	2920	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
586	2925	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
587	2930	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
588	2935	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
589	2940	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
590	2945	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
591	2950	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
592	2955	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
593	2960	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
594	2965	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
595	2970	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
596	2975	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
597	2980	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
598	2985	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
599	2990	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
600	2995	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
601	3000	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
602	3005	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
603	3010	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
604	3015	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
605	3020	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
606	3025	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
607	3030	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
608	3035	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
609	3040	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
610	3045	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
611	3050	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
612	3055	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
613	3060	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
614	3065	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
615	3070	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
616	3075	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
617	3080	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
618	3085	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
619	3090	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
620	3095	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
621	3100	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
622	3105	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
623	3110	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
624	3115	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
625	3120	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
626	3125	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
627	3130	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
628	3135	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
629	3140	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
630	3145	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
631	3150	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
632	3155	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
633	3160	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
634	3165	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
635	3170	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
636	3175	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
637	3180	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
638	3185	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
639	3190	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
640	3195	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
641	3200	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
642	3205	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
643	3210	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
644	3215	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
645	3220	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
646	3225	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
647	3230	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
648	3235	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
649	3240	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
650	3245	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
651	3250	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
652	3255	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
653	3260	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
654	3265	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
655	3270	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
656	3275	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
657	3280	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
658	3285	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
659	3290	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
660	3295	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
661	3300	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
662	3305	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
663	3310	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
664	3315	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
665	3320	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
666	3325	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
667	3330	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
668	3335	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00

669	3340	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
670	3345	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
671	3350	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
672	3355	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
673	3360	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
674	3365	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
675	3370	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
676	3375	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
677	3380	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
678	3385	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
679	3390	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
680	3395	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
681	3400	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
682	3405	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
683	3410	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
684	3415	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
685	3420	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
686	3425	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
687	3430	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
688	3435	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
689	3440	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
690	3445	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
691	3450	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
692	3455	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
693	3460	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
694	3465	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
695	3470	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
696	3475	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
697	3480	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
698	3485	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
699	3490	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
700	3495	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
701	3500	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
702	3505	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
703	3510	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
704	3515	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
705	3520	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
706	3525	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
707	3530	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
708	3535	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
709	3540	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
710	3545	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
711	3550	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
712	3555	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
713	3560	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
714	3565	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
715	3570	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
716	3575	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
717	3580	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
718	3585	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
719	3590	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
720	3595	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
721	3600	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
722	3605	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
723	3610	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
724	3615	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
725	3620	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
726	3625	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
727	3630	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
728	3635	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
729	3640	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
730	3645	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
731	3650	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
732	3655	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
733	3660	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
734	3665	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
735	3670	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
736	3675	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
737	3680	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
738	3685	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
739	3690	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
740	3695	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
741	3700	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
742	3705	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
743	3710	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
744	3715	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
745	3720	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
746	3725	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
747	3730	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
748	3735	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
749	3740	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
750	3745	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
751	3750	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
752	3755	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
753	3760	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
754	3765	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
755	3770	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
756	3775	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
757	3780	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
758	3785	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
759	3790	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
760	3795	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
761	3800	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
762	3805	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
763	3810	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
764	3815	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
765	3820	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
766	3825	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
767	3830	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
768	3835	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
769	3840	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
770	3845	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
771	3850	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
772	3855	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
773	3860	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
774	3865	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
775	3870	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
776	3875	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
777	3880	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
778	3885	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
779	3890	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
780	3895	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
781	3900	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
782	3905	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
783	3910	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
784	3915	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
785	3920	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
786	3925	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
787	3930	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
788	3935	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
789	3940	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
790	3945	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
791	3950	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
792	3955	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
793	3960	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
794	3965	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
795	3970	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
796	3975	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
797	3980	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
798	3985	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
799	3990	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
800	3995	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
801	4000	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
802	4005	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00

803	4010	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
804	4015	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
805	4020	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
806	4025	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
807	4030	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
808	4035	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
809	4040	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
810	4045	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
811	4050	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
812	4055	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
813	4060	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
814	4065	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
815	4070	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
816	4075	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
817	4080	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
818	4085	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
819	4090	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
820	4095	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
821	4100	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
822	4105	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
823	4110	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
824	4115	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
825	4120	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
826	4125	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
827	4130	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
828	4135	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
829	4140	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
830	4145	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
831	4150	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
832	4155	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
833	4160	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
834	4165	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
835	4170	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
836	4175	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
837	4180	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
838	4185	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
839	4190	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
840	4195	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
841	4200	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
842	4205	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
843	4210	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
844	4215	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
845	4220	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
846	4225	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
847	4230	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
848	4235	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
849	4240	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
850	4245	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
851	4250	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
852	4255	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
853	4260	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
854	4265	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
855	4270	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
856	4275	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
857	4280	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
858	4285	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
859	4290	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
860	4295	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
861	4300	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
862	4305	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
863	4310	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
864	4315	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
865	4320	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
866	4325	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
867	4330	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
868	4335	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
869	4340	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
870	4345	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
871	4350	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
872	4355	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
873	4360	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
874	4365	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
875	4370	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
876	4375	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
877	4380	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
878	4385	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
879	4390	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
880	4395	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
881	4400	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
882	4405	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
883	4410	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
884	4415	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
885	4420	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
886	4425	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
887	4430	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
888	4435	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
889	4440	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
890	4445	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
891	4450	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
892	4455	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
893	4460	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
894	4465	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
895	4470	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
896	4475	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00
897	4480	0.00	0.00	1,311,180.00	0.00	0.00	1,312,476.23	0.00


Via Princessa BMP Flow Rate Balance and Storage Curves
Storm Inflow
Infiltration Outflow
Storage Volume
Peak Storage Volume = 11.0 ac-ft
BMP Footprint = 2.1 ac
Max Infiltration Rate = 10.3 cfs
Time to Drain = 40.6 hrs
Flow (cfs)
Volume (cf)
Time (min)
85.00
80.00
75.00
70.00
65.00
60.00
55.00
50.00
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
600,000
500,000
400,000
300,000
200,000
100,000
0
-300
200
700
1,200
1,700
2,200
2,700
3,200

ATTACHMENTS FOR SECTION 3.5:

LONG-TERM PERFORMANCE

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ATTACHMENTS FOR SECTION 4.2:

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SCV GSA

July 14, 2022

Heather Merenda, Stormwater Compliance Administrator
City of Santa Clarita
23920 Valencia Blvd
Santa Clarita, CA 91355

RE: Letter of Concurrence for the Via Princessa Regional Best Management Practice and Park Project Measure W Application

Dear Ms. Merenda:

As the Board President, I am writing on behalf of the Santa Clarita Valley Groundwater Sustainability Agency (SCV-GSA), in support of the City of Santa Clarita's subject project and its request for funding from the Safe Clean Water Program.

The project location is within the Santa Clara River Valley East Groundwater Subbasin (Subbasin) along the south bank of the Santa Clara River, north of the Via Princessa Metrolink Station and east of the Whites Canyon Rd. which is within the groundwater basin managed by the SCV-GSA. In January this year the Groundwater Sustainability Plan (GSP) was approved by our Board of Directors after a multi-year effort with significant stakeholder engagement.

The GSP encourages projects in the basin that support good groundwater management practices. These projects include several ideas, including but not limited to those for removal of invasive species, managed aquifer recharge projects, aquifer storage and recovery and Bouquet Canyon Creek restoration.

The City of Santa Clarita will provide an application to the Safe Clean Water Program (SCWP) seeking funding for the subject project. Part of the SCWP process includes evaluating the scoring for the project and the City has advised the SCV-GSA that additional points may be provided in scoring consistent with the Safe Clean Water program 2022 Interim Guidance. This guidance allows for a maximum of 12 points for a water supply benefit based on number of acre feet recharged each year. The Interim Guidance recognizes uncertainties associated with quantifying groundwater recharge and associated benefit to water supply and even describes approaches to address five kinds of scoring uncertainty. The City has identified that this project should obtain points for a water supply benefit as the infiltrated water would be available as additional basin recharge.

According to the SCWP interim guidance, if a project proponent provides written concurrence from the agency managing the groundwater basin that the project is believed to increase local groundwater supplies, then the project's full capacity to infiltrate water will be considered by the Scoring Committee and WASCs as a benefit to locally available water supply.

The City has provided technical information describing the recharge benefit to water supply. Its consultant, GSI Water Solutions has prepared a May 13, 2022 “Summary of Water Supply Benefits for the Proposed Via Princessa Infiltration BMP” analysis (attached) that finds annual infiltration volumes based on three separate storm scenarios range from 34.2 AF, 172.5 AF, and 247.7 AF. The analysis also found that multiple 85^{th} percentile storm runoff events from the Honby Channel at the proposed project could raise the water table in the surficial aquifer by 0.25 to 0.5 feet on a long-term basis, which would also create slightly increased groundwater elevations in some nearby wells. SCV-GSA Staff feel that the analysis demonstrates additional groundwater recharge above current levels in the area.

In addition to groundwater recharge, the project will intercept urban runoff from Honby Channel en-route to the river. All pollutants associated with the 85^{th} percentile storm will be intercepted by the facility and will not reach the Santa Clara River. The water captured by the proposed BMP will also undergo pretreatment in a hydrodynamic separator prior to being infiltrated into the ground which will remove sediment and trash. Further, the City of Santa Clarita will install flow monitoring equipment to quantify the infiltration measurements over the longer term.

Conclusion

Based on the analysis provided by GSI Water Solutions, Inc. the SCV-GSA concurs that the subject project will provide increased groundwater recharge above current amounts in this area, which benefits groundwater supply at nearby wells. On behalf of the Santa Clarita Valley Groundwater Sustainability Agency, please accept this letter of support for the Via Princessa Regional Best Management Practice and Park Project.

Sincerely,

Maria Gutzeit, Board President
Santa Clarita Valley Groundwater Sustainability Agency

attachment

Summary of Water Supply Benefits for the Proposed Via Princessa Infiltration BMP

Prepared by GSI Water Solutions (May 13, 2022)

The water supply benefits from the proposed Via Princessa Infiltration BMP project were evaluated using a three-dimensional numerical groundwater flow model that was recently developed for the local groundwater basin, during the preparation of a Groundwater Sustainability Plan on behalf of the Santa Clarita Valley Groundwater Sustainability Agency. The groundwater model simulates the two primary aquifers in the basin - the surficial Alluvial Aquifer which is present beneath the Via Princessa site and the deeper Saugus Formation which lies just west of the site.

The model was used to simulate infiltration of Honby Channel flows just above its confluence with the Santa Clara River during a 25-month period from January 2006 through January 2008. Precipitation records at a nearby monitoring station with the longest record in Santa Clarita (the Newhall Fire Station #73 gage) show that rainfall during this period (13.89 inches in 2006 and 5.78 inches in 2007) was generally below the 1930-2019 historical mean rainfall of 17.29 inches and also below the more recent 30-year (1990-2019) mean rainfall of 16.15 inches. Monthly rainfall in January 2008 was 13.83 inches, which is a monthly rainfall volume that has not been exceeded since then and is nearly as high as occurred during a 4-month period of high rainfall from December 2004 through March 2005 that created the highest streamflows in the Santa Clara River and its tributaries recorded so far during the 21st century.

The model simulated the following infiltration volumes during this 25-month period:

1. Seven months of 85th percentile events during 2006 that infiltrated 247.7 acre-feet (AF) of water
2. Eight months of 85th percentile events during 2007 that infiltrated 172.5 AF of water
3. A 100-year storm event in January 2008 that infiltrated 34.2 AF of water

The groundwater model indicates that (1) the 100-year storm event would raise the elevation of the underlying water table in the Alluvial Aquifer by approximately 5 feet directly beneath the BMP during the infiltration event, and (2) this mound would dissipate quickly after the 100-year infiltration event. The rapid rise and decrease of the water table directly beneath the infiltration BMP would occur because of the high permeability of the sediments comprising the Alluvial Aquifer. The predicted rapid rise of the water table during a recharge event is consistent with long-term historical water level records at nearby production wells, which show that groundwater levels in the Alluvial Aquifer rise rapidly throughout the region during high-rainfall months. These records, well performance tests at nearby production wells, and calibration of the model to these two data sets together indicate that the horizontal hydraulic conductivity of the Alluvial Aquifer may be as high as 1,500 feet per day and that groundwater flow velocities likely range between approximately 50 and 250 feet per day in the Alluvial Aquifer.

Away from the BMP, the groundwater modeling results indicate that infiltrating multiple 85th-percentile storm runoff events from Honby Channel at the proposed Via Princessa BMP could raise the water table in the surficial Alluvial Aquifer by 0.25 to 0.5 feet on a long-term basis. Away from the BMP, a 100-year storm event could raise the water table by an additional 0.5 feet on a temporary basis, but the benefit of this event would dissipate within several months to a year if no similar size storms occur soon afterwards. The model also indicates that these increased groundwater elevations could occur not only at the nearest water supply wells (which are located across the river at the SCWD North Oaks wellfield), but also at the next upstream water supply well (the SCWD-Sierra well, located one-half mile upstream of North Oaks) and even as far as 2 miles downstream of the BMP (at the SCWD-Santa Clara water supply well).

Groundwater Modeling Analysis of the Influence of a Via Princessa Park Infiltration BMP on Groundwater Elevations in the Underlying Alluvial Aquifer (Santa Clarita, California)

Prepared by GSI Water Solutions

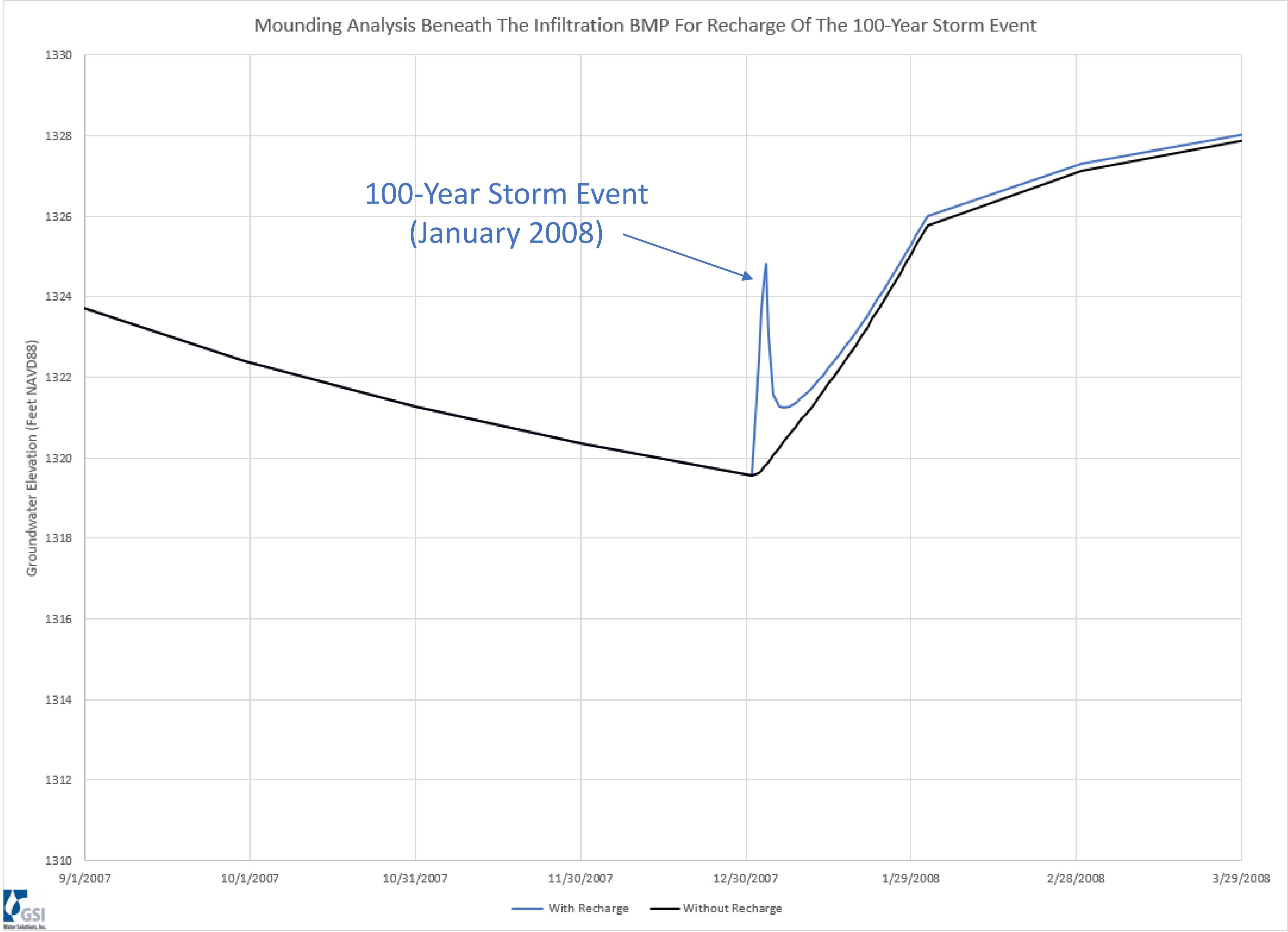
May 12, 2022

GSI Water Solutions, Inc.

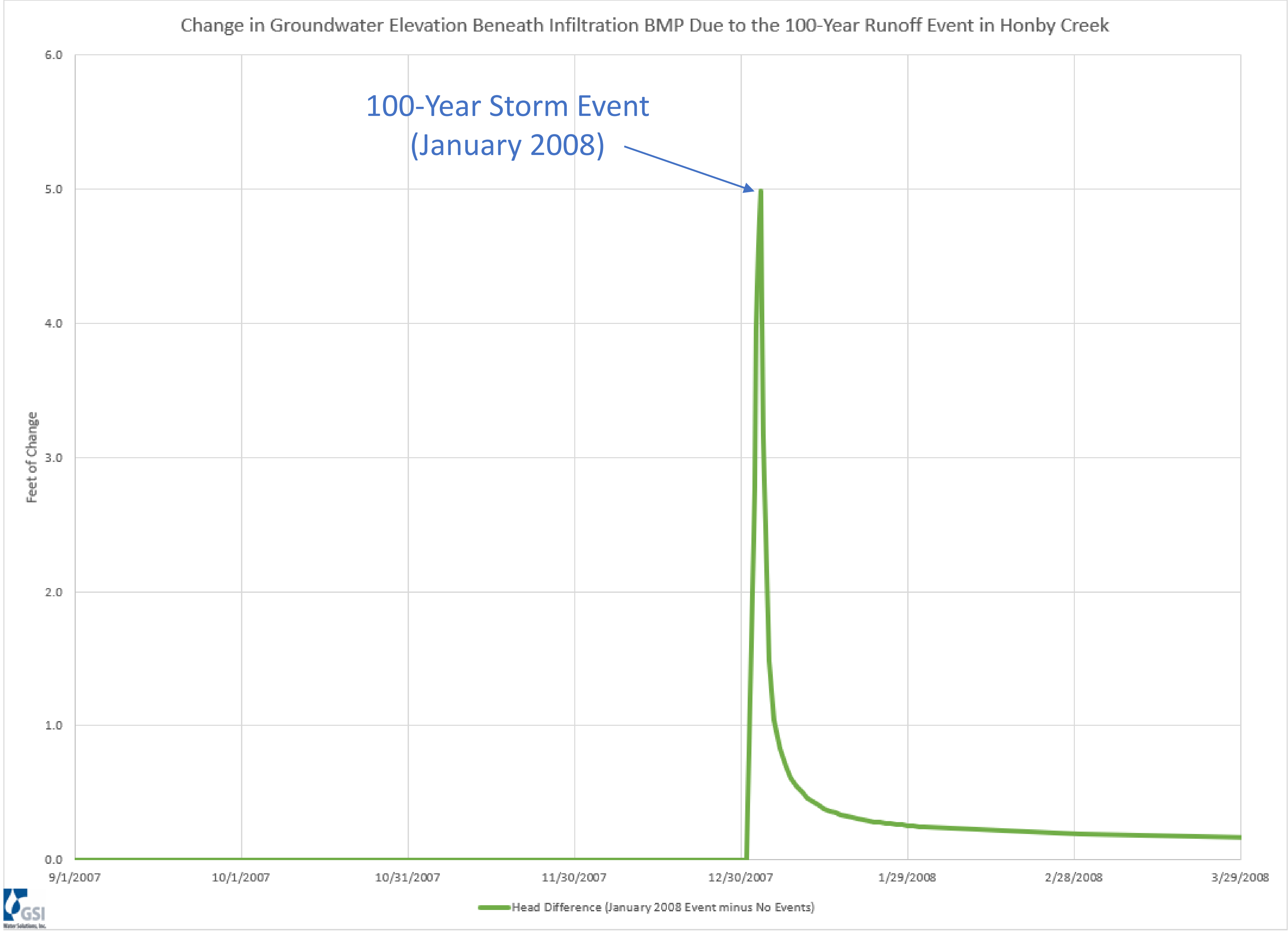
Nearest Downstream Production Well
SCWD-Santa Clara
CANYON COUNTRY
Nearest Upstream Production Well
SCWD-Sierra
Cross-Gradient Production Well
SCWD-NorthOaks
BMP Facility
Via Princess Park BMP
Soledad Canyon Rd
Santa Clara River
Whites Canyon Rd
Via Princessa
Sierra Hwy
Sandy Dr
Jakes Way
Collins Rd
Flowers Ct
Rainbow Glen Dr
Sheldon Ave
Pamela Dr
Terri Dr
Neff Ct
May Way
Oak Canyon Rd
Google Earth
1985
34°24'59.66" N 118°28'25.43" W elev 1363 ft eye alt 12156 ft

Simulated Infiltration Events

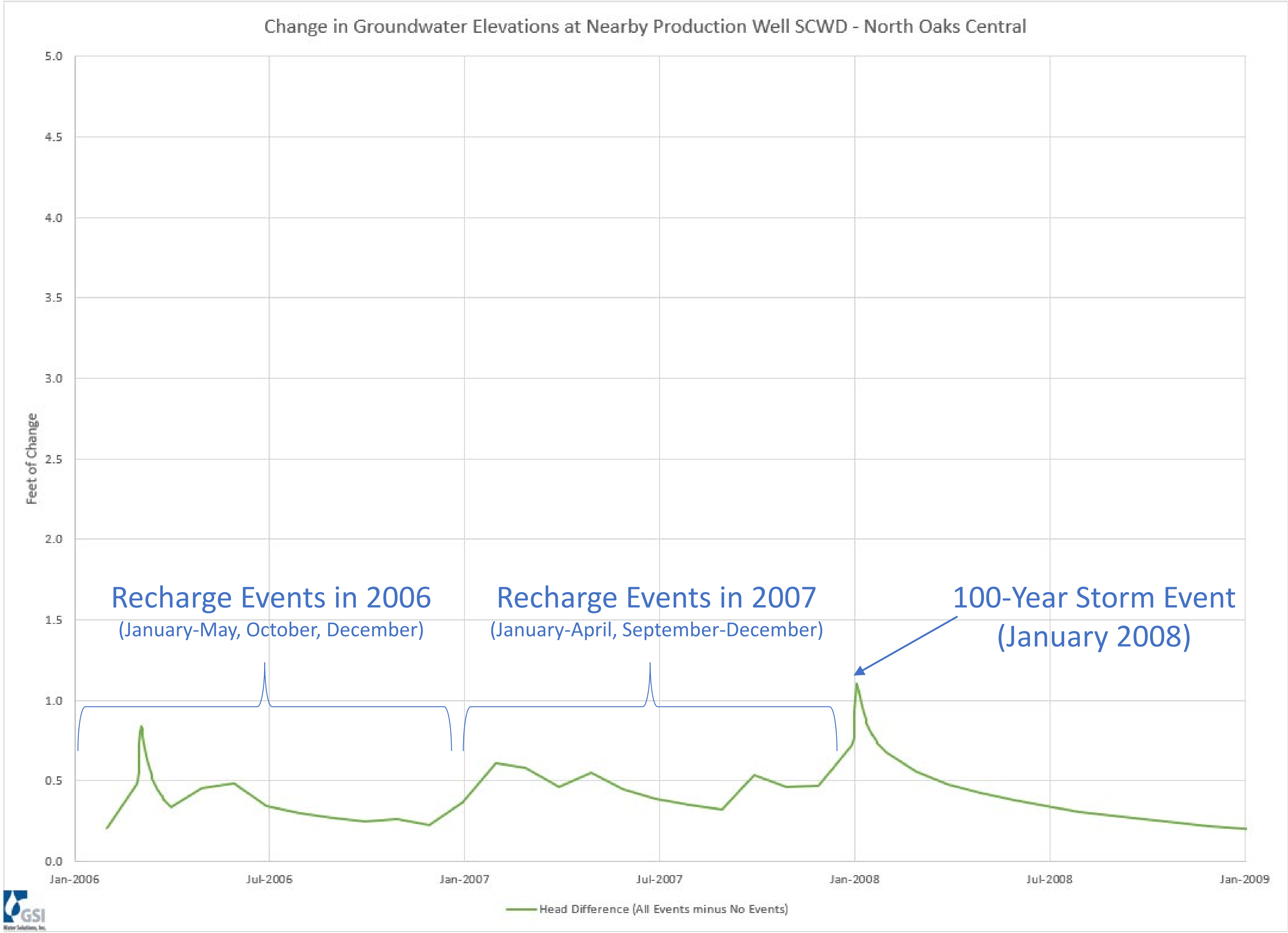
Month	Infiltration Volume (AF)	Type of Event
January 2006	30.1	85th Percentile or Less
February 2006	53.2	85th Percentile or Less
March 2006	79.6	85th Percentile or Less
April 2006	30.8	85th Percentile or Less
May 2006	28.1	85th Percentile or Less
October 2006	4.8	85th Percentile or Less
December 2006	21.1	85th Percentile or Less
January 2007	43.0	85th Percentile or Less
February 2007	18.4	85th Percentile or Less
March 2007	1.1	85th Percentile or Less
April 2007	20.1	85th Percentile or Less
September 2007	31.2	85th Percentile or Less
October 2007	7.0	85th Percentile or Less
November 2007	10.7	85th Percentile or Less
December 2007	41.3	85th Percentile or Less
January 2008	34.2	100-Year Event



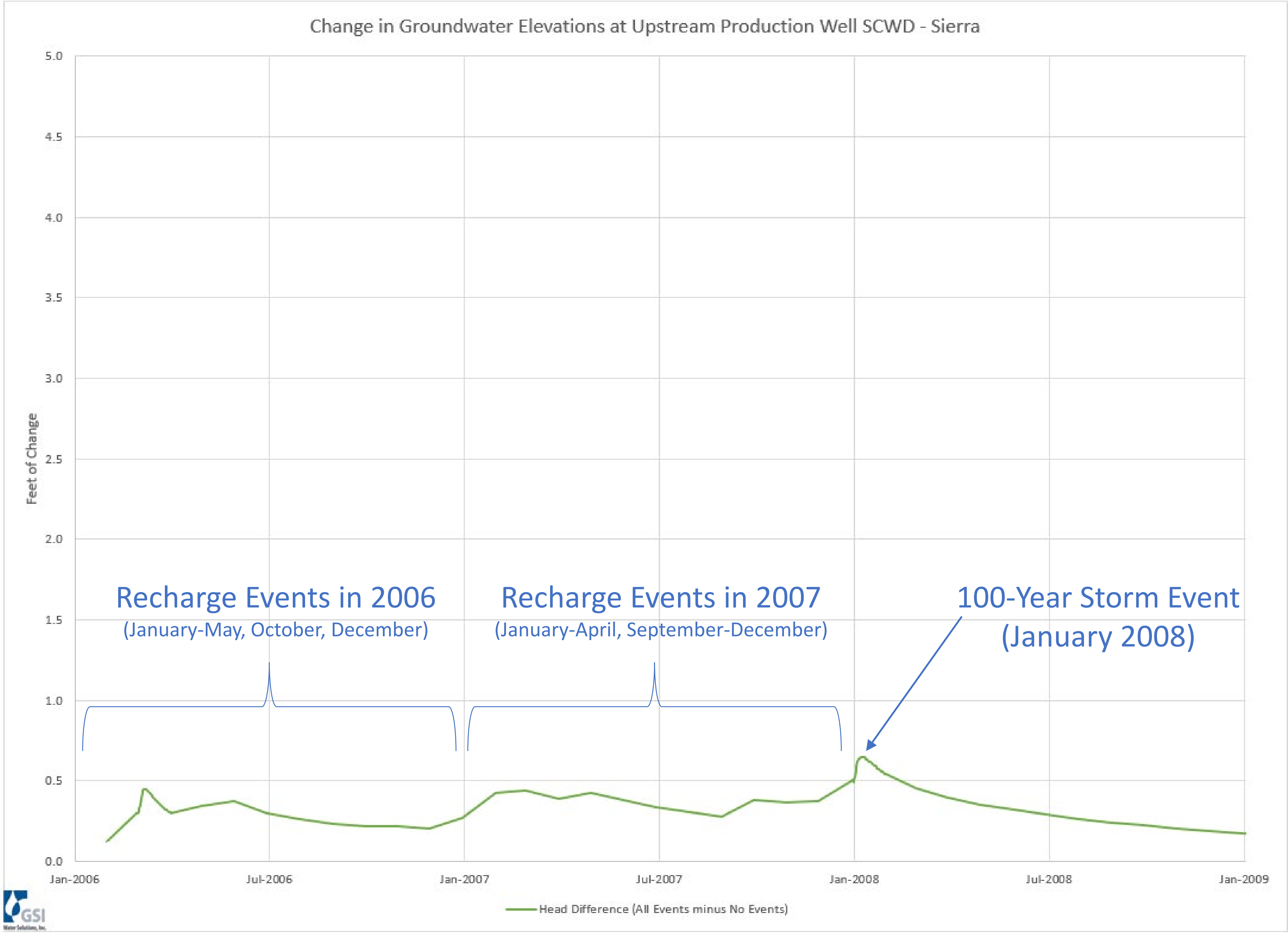
Mounding Analysis Beneath The Infiltration BMP For Recharge Of The 100-Year Storm Event
Groundwater Elevation (Feet NAVD88)
1330
1328
1326
1324
1322
1320
1318
1316
1314
1312
1310
9/1/2007
10/1/2007
10/31/2007
11/30/2007
12/30/2007
1/29/2008
2/28/2008
3/29/2008
100-Year Storm Event
(January 2008)
With Recharge
Without Recharge



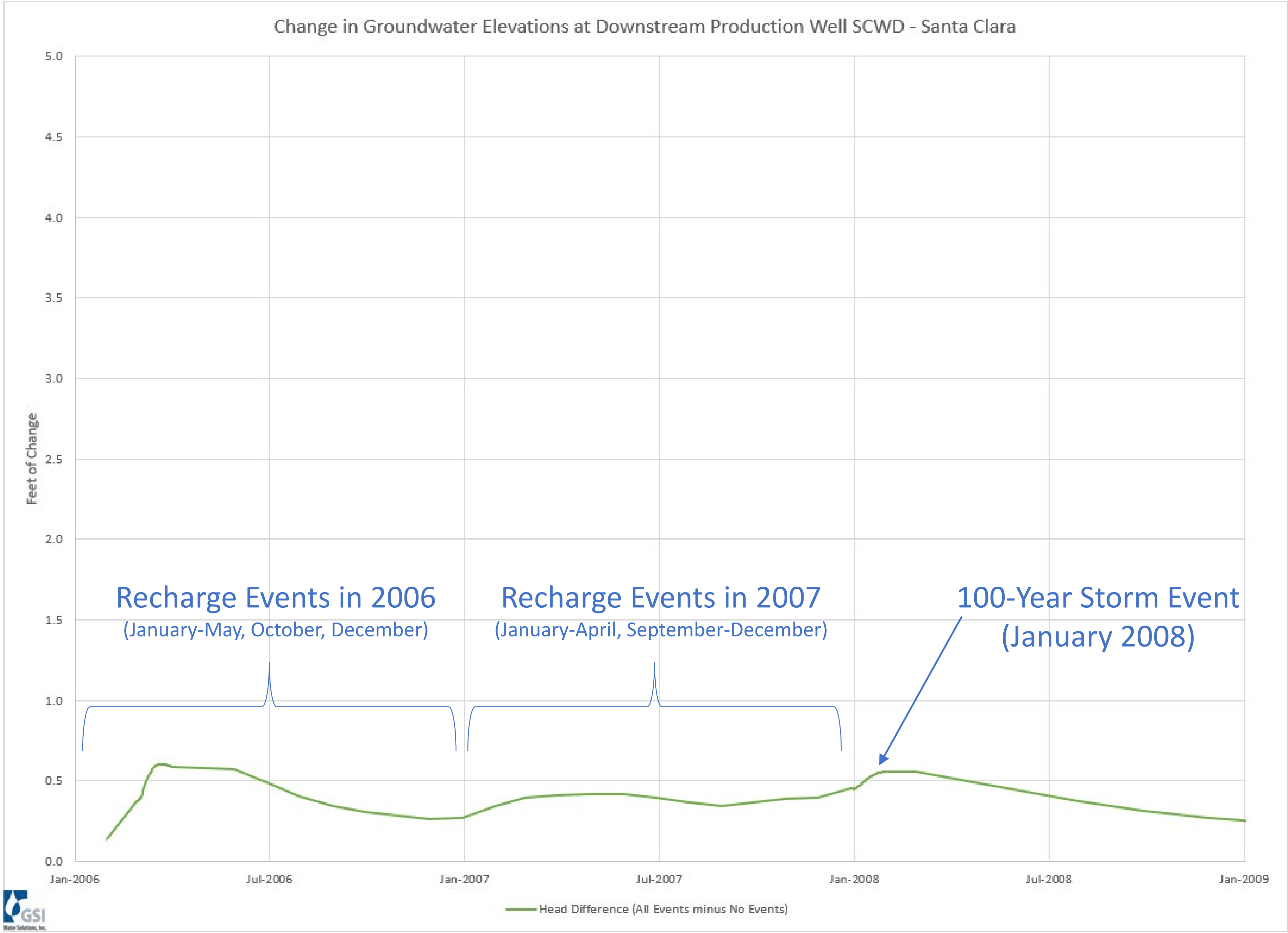
Change in Groundwater Elevation Beneath Infiltration BMP Due to the 100-Year Runoff Event in Honby Creek
100-Year Storm Event
(January 2008)
Feet of Change
6.0
5.0
4.0
3.0
2.0
1.0
0.0
9/1/2007
10/1/2007
10/31/2007
11/30/2007
12/30/2007
1/29/2008
2/28/2008
3/29/2008
Head Difference (January 2008 Event minus No Events)
GSI

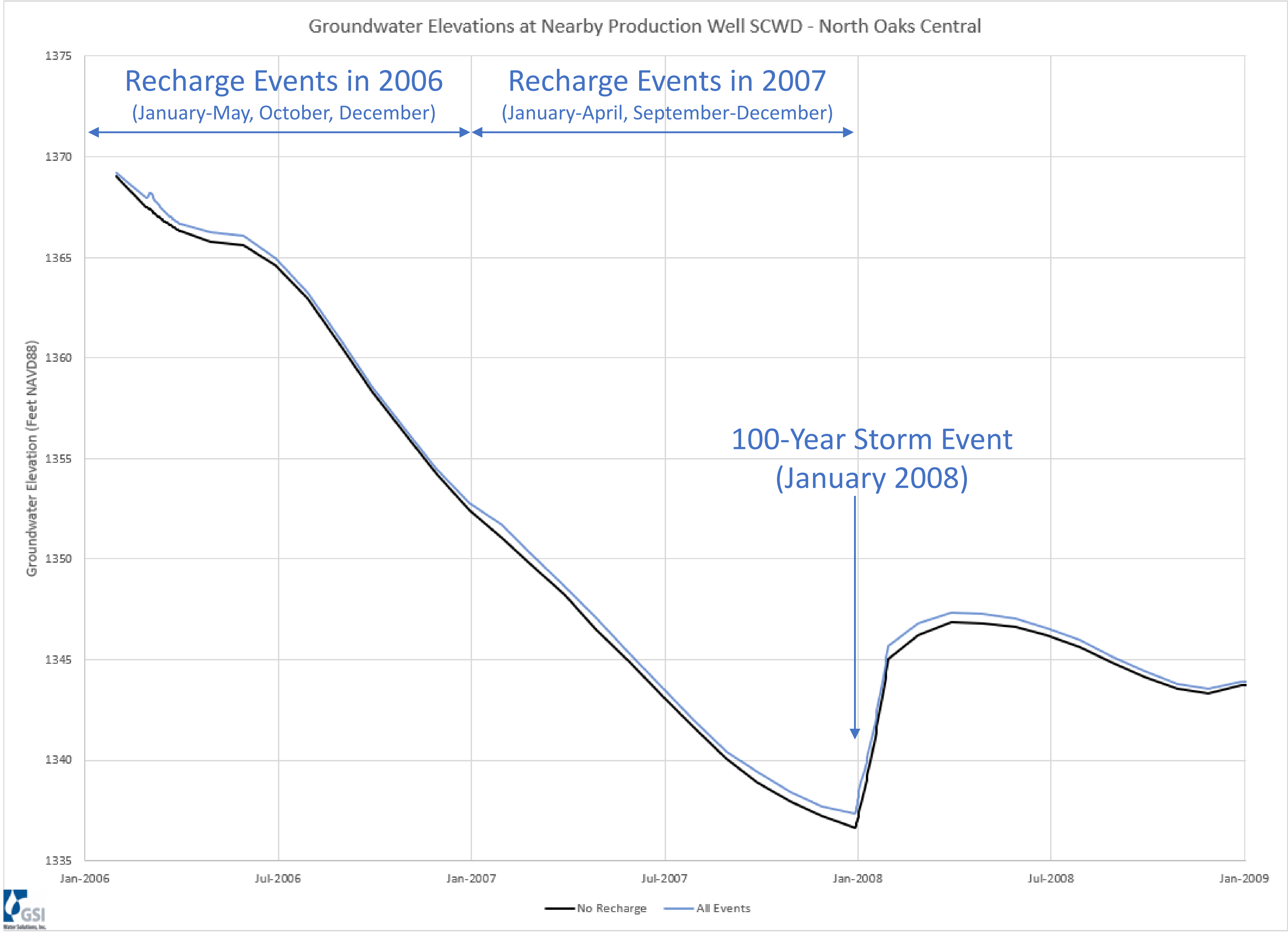


Change in Groundwater Elevations at Nearby Production Well SCWD - North Oaks Central
Feet of Change
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Jan-2006
Jul-2006
Jan-2007
Jul-2007
Jan-2008
Jul-2008
Jan-2009
Recharge Events in 2006
(January-May, October, December)
Recharge Events in 2007
(January-April, September-December)
100-Year Storm Event
(January 2008)
Head Difference (All Events minus No Events)
GSI

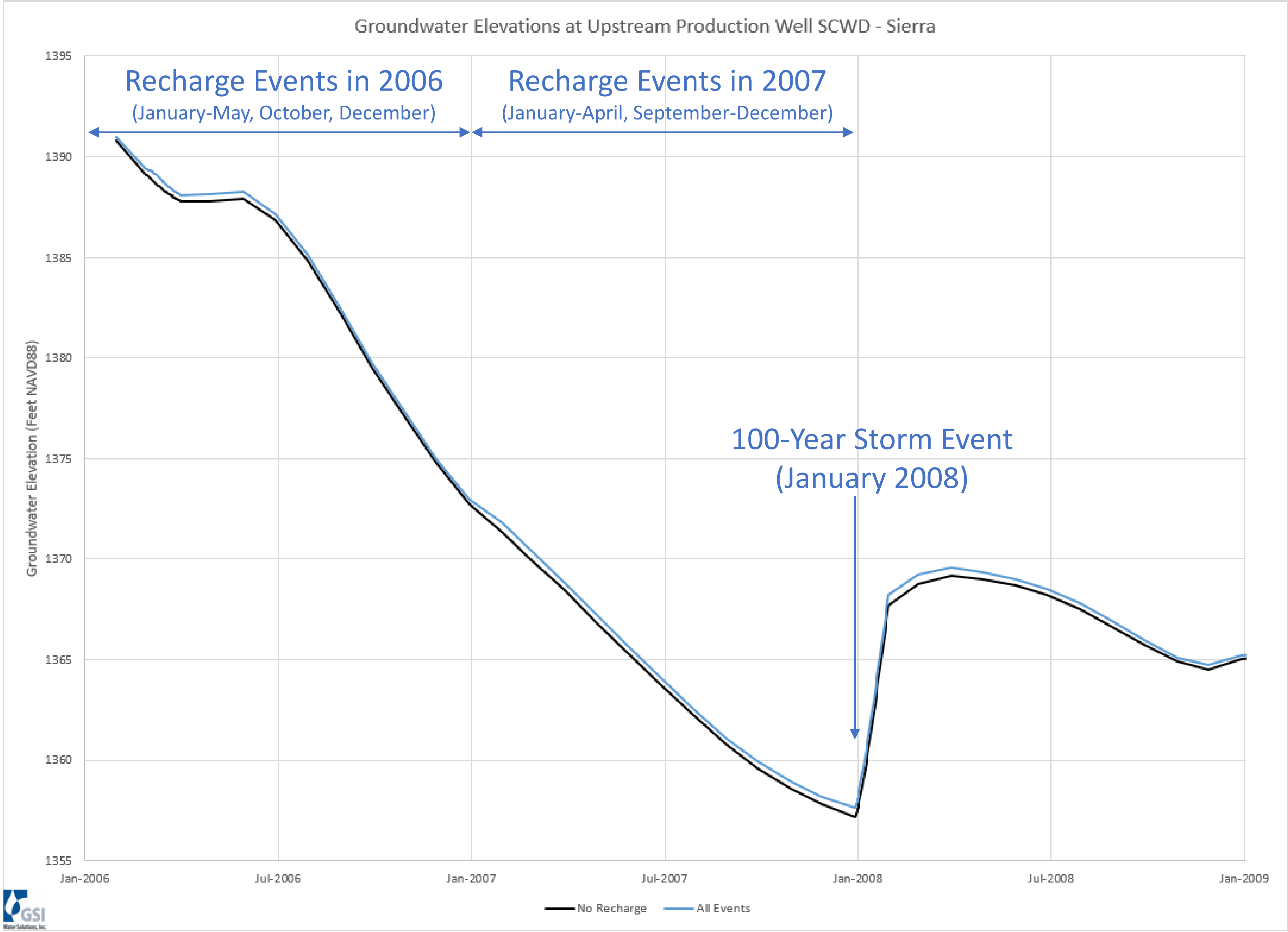


Change in Groundwater Elevations at Upstream Production Well SCWD - Sierra
Feet of Change
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Jan-2006
Jul-2006
Jan-2007
Jul-2007
Jan-2008
Jul-2008
Jan-2009
Recharge Events in 2006
(January-May, October, December)
Recharge Events in 2007
(January-April, September-December)
100-Year Storm Event
(January 2008)
Head Difference (All Events minus No Events)
GSI

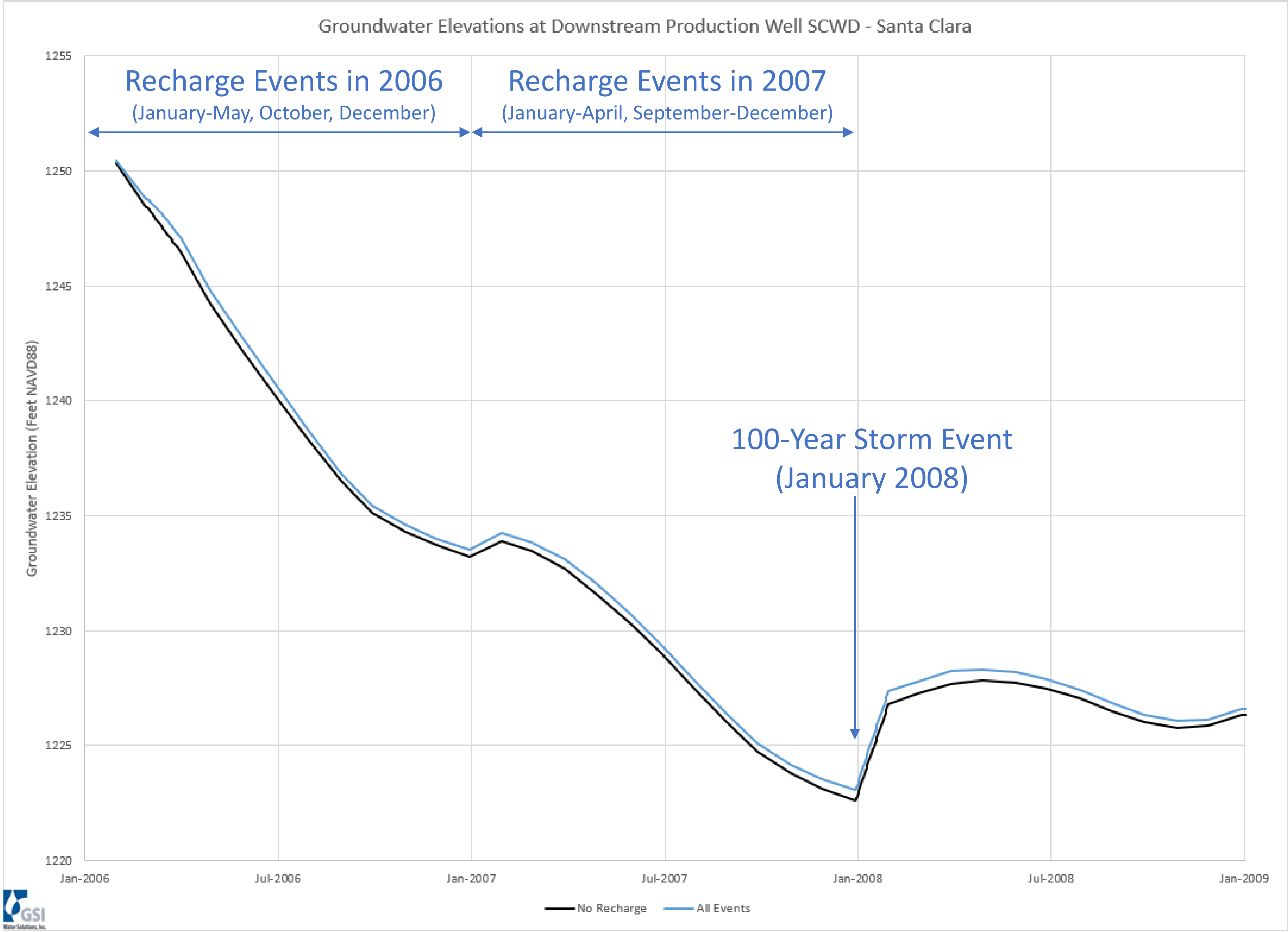

Change in Groundwater Elevations at Downstream Production Well SCWD - Santa Clara
Feet of Change
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Jan-2006
Jul-2006
Jan-2007
Jul-2007
Jan-2008
Jul-2008
Jan-2009
Recharge Events in 2006
(January-May, October, December)
Recharge Events in 2007
(January-April, September-December)
100-Year Storm Event
(January 2008)
Head Difference (All Events minus No Events)
GSI



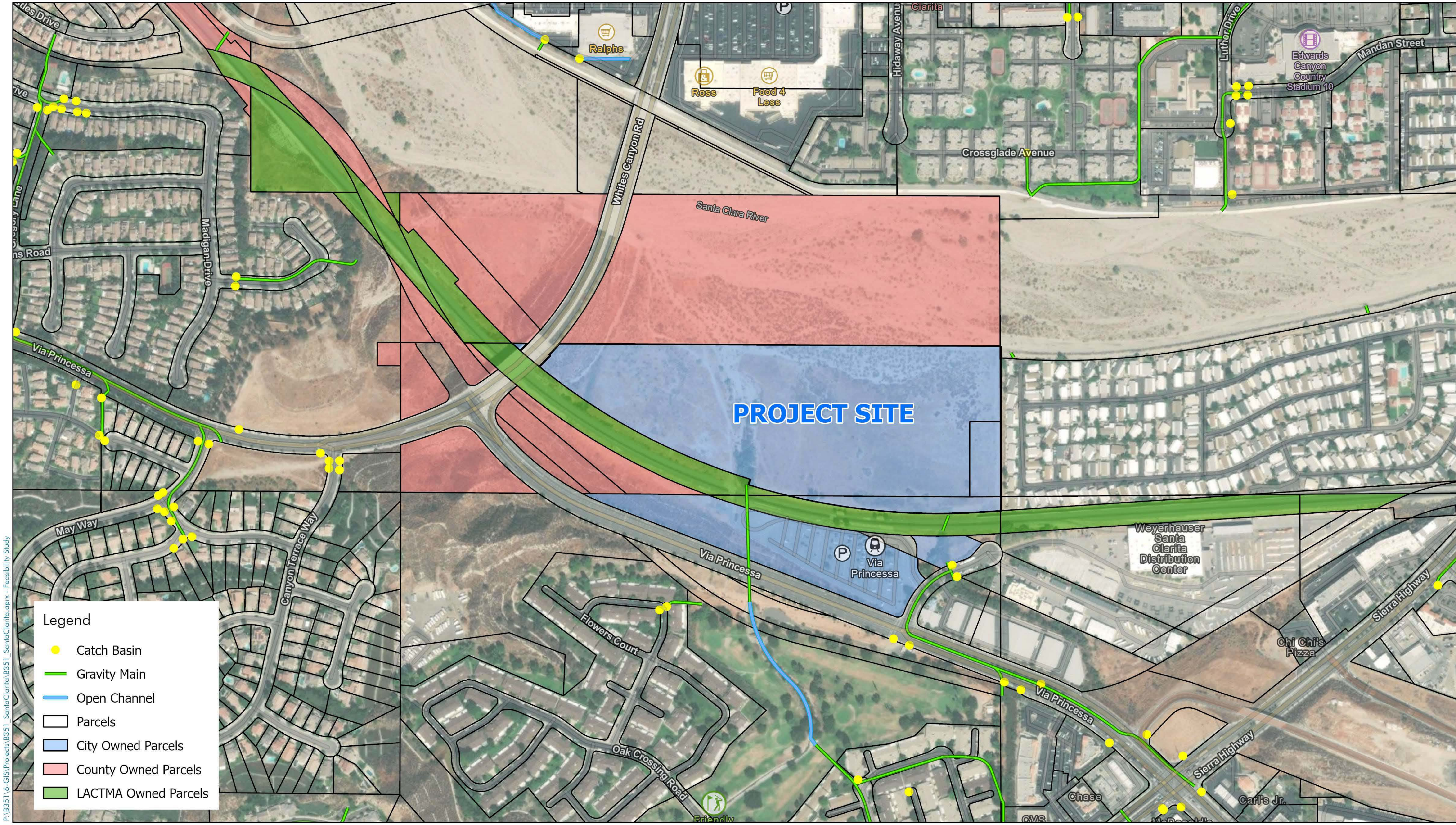
Groundwater Elevations at Nearby Production Well SCWD - North Oaks Central
Recharge Events in 2006
(January-May, October, December)
Recharge Events in 2007
(January-April, September-December)
100-Year Storm Event
(January 2008)
Groundwater Elevation (Feet NAVD88)
1375
1370
1365
1360
1355
1350
1345
1340
1335
Jan-2006
Jul-2006
Jan-2007
Jul-2007
Jan-2008
Jul-2008
Jan-2009
No Recharge
All Events



Groundwater Elevations at Upstream Production Well SCWD - Sierra
Recharge Events in 2006
(January-May, October, December)
Recharge Events in 2007
(January-April, September-December)
100-Year Storm Event
(January 2008)
Groundwater Elevation (Feet NAVD88)
1395
1390
1385
1380
1375
1370
1365
1360
1355
Jan-2006
Jul-2006
Jan-2007
Jul-2007
Jan-2008
Jul-2008
Jan-2009
No Recharge
All Events



Groundwater Elevations at Downstream Production Well SCWD - Santa Clara
Recharge Events in 2006
(January-May, October, December)
Recharge Events in 2007
(January-April, September-December)
100-Year Storm Event
(January 2008)
Groundwater Elevation (Feet NAVD88)
1255
1250
1245
1240
1235
1230
1225
1220
Jan-2006
Jul-2006
Jan-2007
Jul-2007
Jan-2008
Jul-2008
Jan-2009
No Recharge
All Events



VIA PRINCESSA PARK AND BMP PROJECT

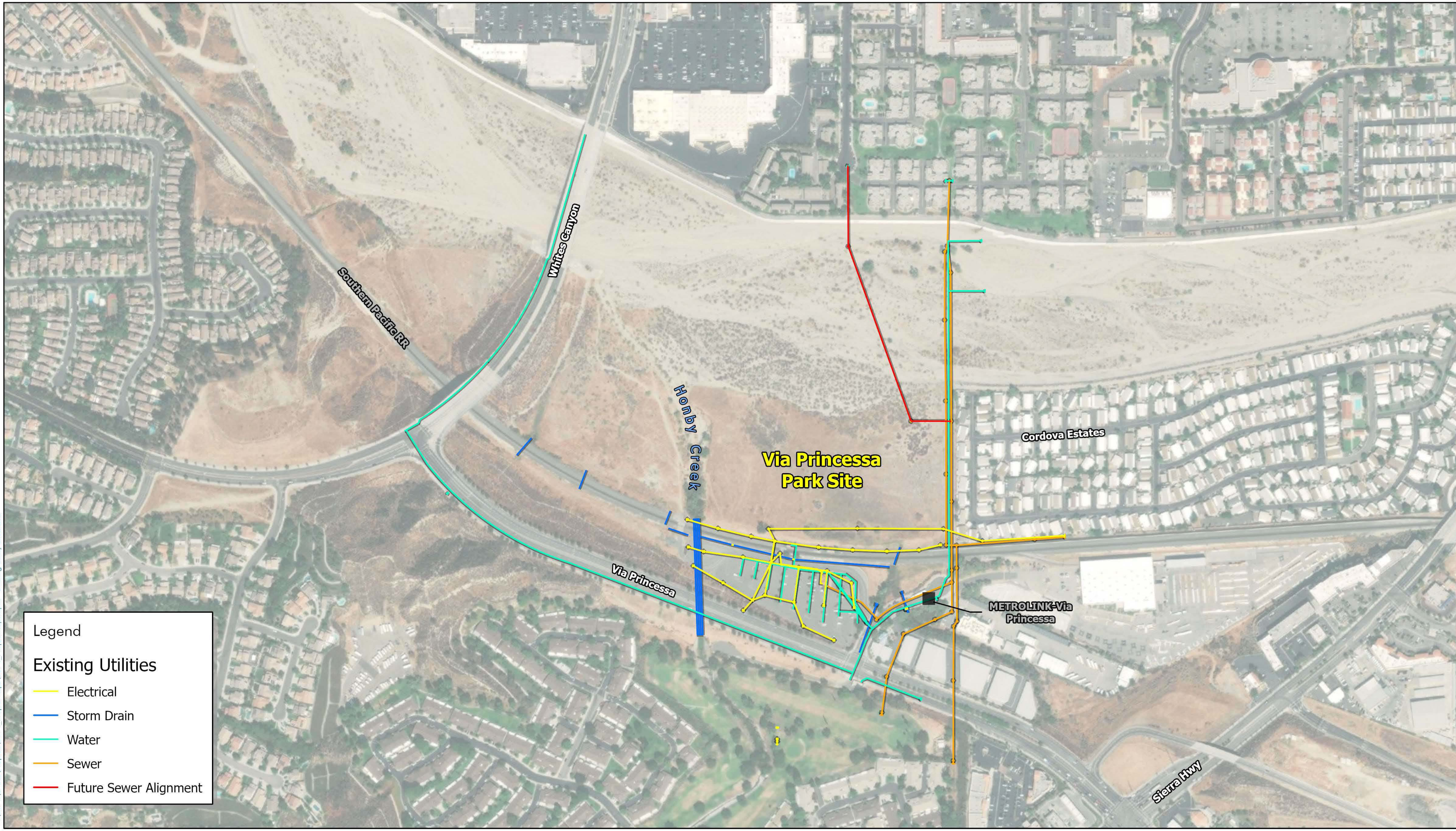
OWNERSHIP & ROW EXHIBIT

PACE Advanced Water Engineering

0 200 400 800 Feet

Date: 3/15/2022

Job Number: B351



VIA PRINCESSA PARK AND BMP PROJECT

EXISTING UTILITY LOCATIONS

PACE Advanced Water Engineering

0 200 400 800 Feet

Date: 5/5/2022

Job Number: B894

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ATTACHMENTS FOR SECTION 4.3:

BENEFIT MAGNITUDE

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ATTACHMENTS FOR SECTION 4.4:

COST EFFECTIVENESS

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ATTACHMENTS FOR SECTION 5.2:

COMMUNITY INVESTMENT

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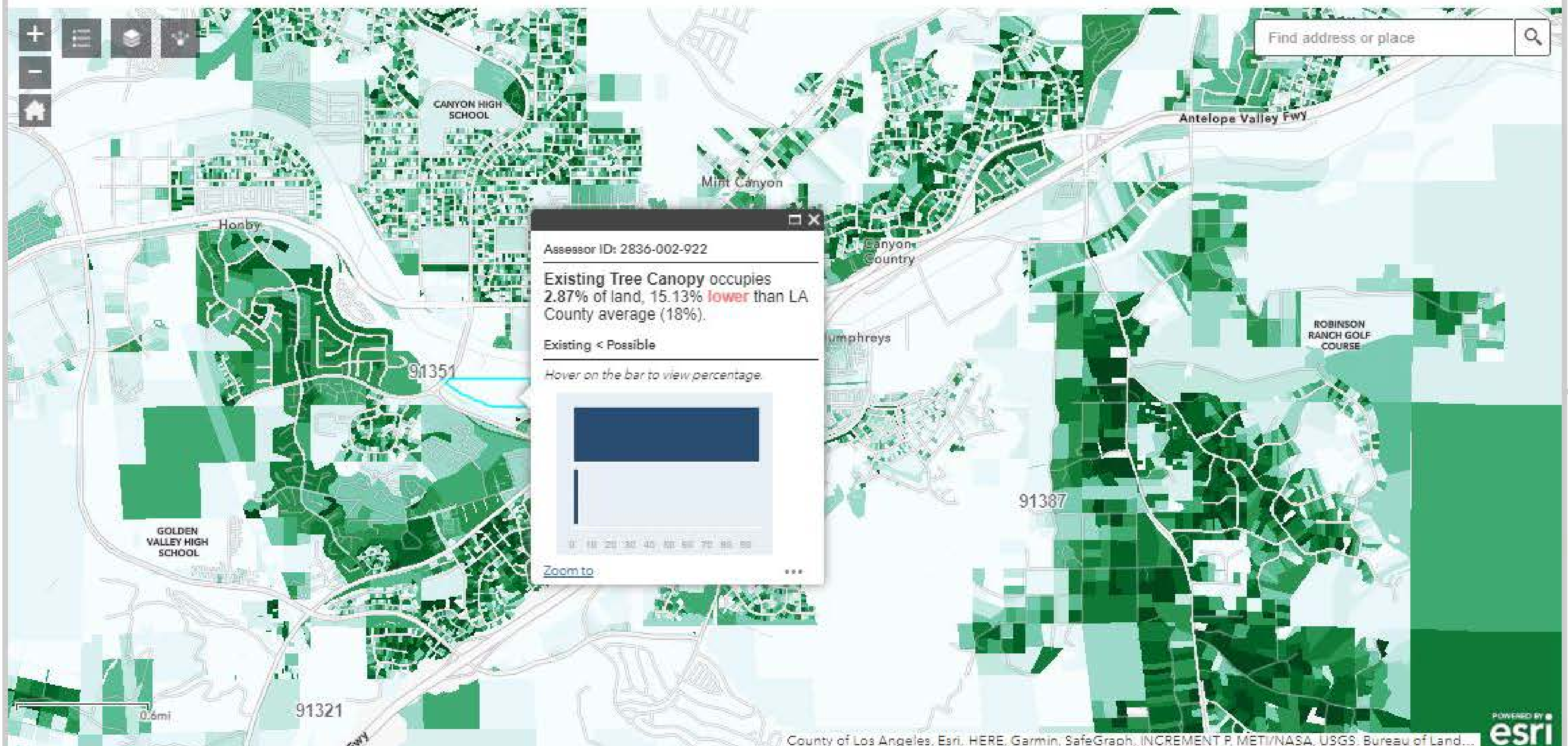
TreePeople

Our Work | Get Involved | Volunteer | Learn | Support Us

Los Angeles County Tree Canopy Map Viewer

Los Angeles County Tree Canopy Basic Viewer

Exploring the Existing and Possible Tree Canopy from the Parcel to the City Level



Average | Promedio   Compare | Comparar

Diagram updates with map view

About This Map | Sobre esta mapa   Credits | Créditos

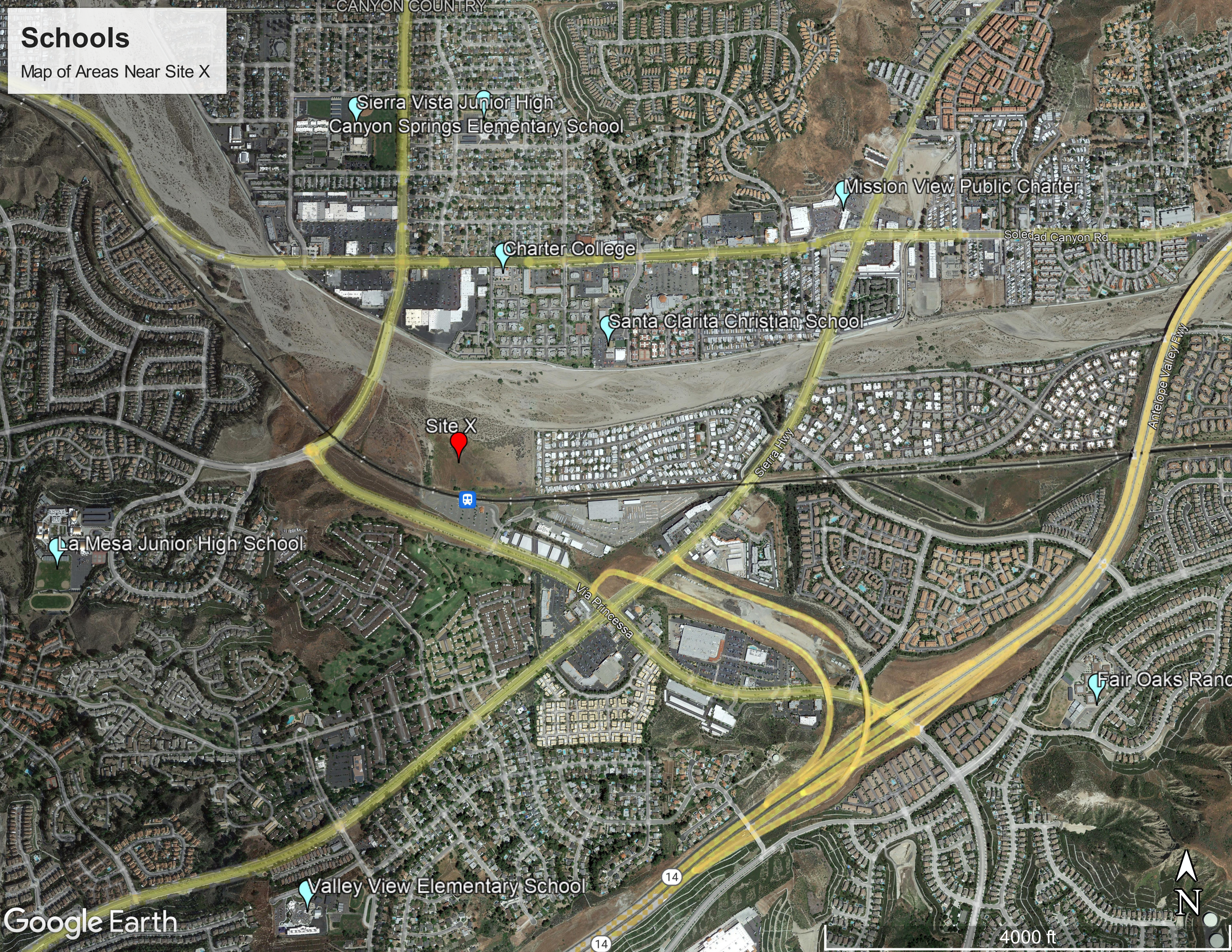
This map shows the *Existing* and *Possible* Tree Canopy Coverage in Los Angeles County. **Possible Tree Canopy** includes areas that are theoretically available for the establishment of tree canopy. This category includes both pervious and impervious areas (asphalt or concrete surfaces, excluding roads and buildings) where improvements could ostensibly be made to accommodate additional trees.

More detailed maps, including multiple land cover types, can be found from our Los Angeles County Tree Canopy Advanced Viewer. A Story Map is available for more information about this project.

By zooming in/out, users can explore tree canopy cover at various geographic units, including: **Parcel, Census Tract, ZIP Code, and City Level**. The **default map** setting is the **ZIP Code level**. Details about existing and possible tree cover are available by clicking within the map.

Este mapa muestra los promedios ***existentes*** y *posibles* del dosel de los árboles en el condado de Los Ángeles.

Al acercar/alejar, los usuarios pueden explorar la cubierta del dosel de los árboles en varias unidades geográficas, incluyendo: **Parcela, Distrito Censal, Código Postal y Nivel de Ciudad**. La configuración de mapa predeterminada es el nivel de código postal. Los detalles sobre la cubierta de árbol existente y posible están disponibles haciendo clic en el mapa.



Schools
Map of Areas Near Site X
CANYON COUNTRY
Sierra Vista Junior High
Canyon Springs Elementary School
Mission View Public Charter
Soledad Canyon Rd
Charter College
Santa Clarita Christian School
Antelope Valley Fwy
Site X
Sierra Hwy
La Mesa Junior High School
Via Princessa
Fair Oaks Ranc
14
Valley View Elementary School
Google Earth
N
4000 ft

VIA PRINCESSA PARK - PLANT PALETTE CHARACTER

BUFFER ZONE (CORDOVA ESTATES)

Acacia baileyana 'Purpurea' Purple-Leaf Acacia
Acacia podalyriifolia Pearl Acacia
Baccharis pilularis 'Pigeon Point' Creeping Coyote Bush
Bouteloua gracilis 'Blonde Ambition' Blue Grama Grass
Cercocarpus betuloides Mountain Mahogany
Eriogonum arborescens Santa Cruz Island Buckwheat
Eriogonum fasciculatum California Buckwheat
Muhlenbergia dubia Pine Muhly
Muhlenbergia rigens Deer Grass
Rhamnus californica 'Mound San Bruno' Coffeeberry

SLOPE STABILIZATION AT BANK LINER (3:1 SLOPE)

Baccharis pilularis 'Pigeon Point' Creeping Coyote Bush
Calliandra californica Baja Fairy Duster
Calliandra eriophylla Fairy Duster
Ceanothus concha Concha Ceanothus
Ceanothus thyrsiflorus var. Yankee Point Yankee Point Ceanothus
Cercocarpus betuloides Mountain Mahogany
Cotoneaster dammeri 'Lowfast' Bearberry Cotoneaster
Epilobium canum California Fuchsia
Eriogonum arborescens Santa Cruz Island Buckwheat
Eriogonum fasciculatum California Buckwheat

Heteromeles arbutifolia Toyon
Rhus integrifolia Lemonade Berry
Rhus ovata Sugar Bush
Romneya coulteri Matilija Poppy
Salvia 'Bee's Bliss' Bee's Bliss Sage
Salvia leucophylla 'Point Sal' Point Sal Sage
Salvia mellifera Black Sage
Salvia sonomensis 'Mrs. Beard' Mrs. Beard Sage
Quercus agrifolia Coast Live Oak
Quercus lobata Valley Oak

POLLINATOR GARDEN

Acacia baileyana 'Purpurea' Purple-Leaf Acacia
Acacia podalyriifolia Pearl Acacia
Cercis occidentalis Western Redbud
Chilopsis linearis Desert Willow
Garrya elliptica Silk-Tassel Bush
Achillea millefolium Common Yarrow
Asclepias californica Milkweed
Asclepias fascicularis Narrow-leaf Milkweed
Calliandra californica Baja Fairy Duster
Calliandra eriophylla Fairy Duster

Ceanothus concha Concha Ceanothus
Ceanothus thyrsiflorus var. Yankee Point Yankee Point Ceanothus
Cistus purpureus Purple Rockrose
Encelia californica Coast Sunflower
Epilobium canum California Fuchsia
Eriogonum arborescens Santa Cruz Island Buckwheat
Eriogonum fasciculatum California Buckwheat
Eschscholzia californica CA Poppy
Heuchera 'Canyon Duet' Pink + White Coral Bells
Heuchera maxima Coral Bells

* *Non-Native Plant Species*

VIA PRINCESSA PARK - PLANT PALETTE CHARACTER

POLLINATOR GARDEN CONTINUED

Lupinus ssp. CA Lupine

Salvia Apiana White Sage

Salvia 'Bee's Bliss' Bee's Bliss Sage

Salvia clevelandii Cleveland's Sage

Salvia leucophylla 'Point Sal' Point Sal Sage

Salvia mellifera Black Sage

Salvia sonomensis 'Mrs. Beard' Mrs. Beard Sage

Salvia spathacea Hummingbird Sage

Verbena lilacina 'De La Mina' De La Mina Verbena

REGIONALLY ADAPTED/FORMALIZED PARK PLANTING

Acacia stenophylla Shoestring Acacia

Acacia podalyriifolia Pearl Acacia

Cercidium x Desert Museum Desert Museum Palo Verde

Cercis occidentalis Western Redbud

Geijera parviflora Australian Willow

Pistacia chinensis Chinese Pistache

Platanus racemosa California Sycamore

Prosopis x Phoenix Thornless Mesquite

Quercus agrifolia Coast Live Oak

Quercus lobata Valley Oak

Searsia lancea African Sumac

Tipuana tipu Tipu Tree

Agave 'Mateo' Matthew's Agave

Artemisia 'Powis Castle' Powis Castle Artemisia

Baccharis pilularis 'Pigeon Point' Creeping Coyote Bush

Bouteloua gracilis Blue Grama Grass

Calistemon viminalis 'Little John' Little John Bottle Brush

Carex Divulsa Berkeley Sedge

Ceanothus thrysiflorus var. Yankee Point Yankee Point Ceanothus

Cistus purpureus Purple Rockrose

Grevillea 'King's Fire' Kings Fire Grevillea

Hesperaloe parviflora False Yucca

Hesperaloe parviflora 'Brakelights' Brakelight False Yucca

Leucadendron galpinii Galpin's Leucadendron

Leucadendron salignum 'Blush' Willowcone Bush

Lomandra longifolia 'Breeze' Dwarf Mat Rush

Muhlenbergia transmorrisonensis Evergreen Fountain Grass

Muhlenbergia lindheimeri 'Autumn Glow' Autumn Glow Muhly

Muhlenbergia Dubia Pine Muhly

Muhlenbergia rigens Deer Grass

Pennisetum 'Fairy Tails' Evergreen Fountain Grass

Pennisetum spathiolatum Slender Veldt Grass

Pittosporum crassifolium 'Compactum' Dwarf Karo

Rhamnus californica 'Mound San Bruno' Coffeeberry

Westringia 'Wynyabbie Gem' Coastal Rosemary

* *Non-Native Plant Species*

VIA PRINCESSA PARK - PLANT PALETTE CHARACTER

BIOSWALES + STORMWATER


Cercis occidentalis
Western Redbud


Chilopsis linearis
Desert Willow


Fraxinus latifolia
Oregon Ash


Platanus racemosa
California Sycamore


Salix laevigata
Red Willow


Salix lasiolepis
Arroyo Willow


Salix lucida ssp. Lasiandra
Shining Willow


Achillea millefolium
Common Yarrow


Berberis aquiolium var repens
Creeping Oregon Grape


Bouteloua gracilis
Blue Grama Grass


Carex Divulsa
Berkeley Sedge


Chondropetalum techtorum
Small Cape Rush


Fragaria chiloensis
Beach Strawberry


Iris douglasiana
Douglas Iris


Juncus patens 'Elk Blue'
Elk Blue CA Grey Rush


Leymus condensatus 'Canyon Prince'
Canyon Prince Wild Rye


Myrica californica
Pacific Wax Myrtle


Prunus ilicifolia
Hollyleaf Cherry


Ribes aureum
Goolden Currant


Sambucus mexicana
Western Elderberry


Scirpus cernuus
Low Bulrush

HYDROSEED - DESERT SAGE SCRUB - WEST PARK


Acmispon glaber
Deerweed


Ambrosia dumosa
Burrow Weed


Artemisia tridentata
Great Basin Sagebrush


Atriplex canescens
Fourwing Saltbush


Atriplex polycarpa
Allscale Saltbush


Chrysothmnus nauseosus
Rabbitbush


Encelia farinose
Brittlebush


Eriodictyon crassifolium
Thick-Leaf Yerba Santa


Eriogonum fasciculatum
CA Buckwheat


Eschscholzia californica ssp. mexicana
Mexican Poppy


Festuca octoflora
Six Weeks Fescue


Larrea tridentata
Creosote


Lasthenia californica
Dwarf Goldfields


Lupinus sparsiflorus
Coulter's Lupine


Peritoma arborea
Bladderpod


Sphaeralcea ambigua
Desert Mallow

✱ *Non-Native Plant Species*

VIA PRINCESSA PARK - PLANT PALETTE CHARACTER

RIPARIAN CORRIDOR + BANK STABILIZATION


Acer negundo
Box Elder


Alnus rhombifolia
White Alder


Arbutus marina
Marina Tree


Cercis occidentalis
Western Redbud


Populus fremontii
Fremont Cottonwood


Platanus racemosa
California Sycamore


Umbellularia californica
CA Laurel


Aquilegia formosa
Western Columbine


Asclepias fasciularis
Narrow-leaf Milkweed


Baccharis slicifolia
Mulefat


Bouteloua gracilis
Blue Grama Grass


Carex Divulsa
Berkeley Sedge


Cephalanthus occidentalis californica
Button Bush


Fragaria chiloensis
Beach Strawberry


Heuchera 'Canyon Delight'
Pink Coral Bells


Heuchera maxima
Coral Bells


Juncus patens 'Elk Blue'
Elk Blue CA Grey Rush


Leymus condensatus 'Canyon Prince'
Canyon Prince Wild Rye


Monardella villosa ssp. franciscana
'Russian River' Coyote Mint


Muhlenbergia Dubia
Pine Muhly


Muhlenbergia rigens
Deer Grass


Ribes indecorum
White Flowering Currant


Ribes malvaceum viridifolium
Chaparral Currant


Ribes sanguineum glutinosum
Pink Flowering Currant


Ribes viburnifolium
Catalina Currant


Scirpus cernuus
Low Bulrush

✱ *Non-Native Plant Species*

This data was produced from the i-Tree Planting Calculator version 2.2.0 for Santa Clarita; CA.
Location: Santa Clarita; CA 91351
Electricity Emissions Factor: 252.4
Fuel Emissions Factor: 52
Lifetime: 40
Tree Mortality: 10
Run Date: 6-9-2022

Group Identifier	Tree Group Characteristics	CO_2 Avoided (pounds)	CO_2 Avoided ($)	CO_2 Sequestered (pounds)	CO_2 Sequestered ($)	Electricity Saved (kWh)	Electricity Saved ($)	Fuel Saved (MMBtu)	Fuel Saved ($)
1	(47.0) Alder, White (Alnus rhombifolia) at 1.5 inches DBH.Planted 20-39 feet and north (0Â°) of buildings that were built post-1980 with heat and A/C.Trees are in excellent condition and planted in full sun.	124,175.30	$2,887.94	304,759.30	$7,087.76	123,987.00	$25,380.14	422.8	$5,470.65
2	(24.0) Paloverde, Blue (Parkinsonia florida) at 1.5 inches DBH.Planted 20-39 feet and north (0Â°) of buildings that were built post-1980 with heat and A/C.Trees are in excellent condition and planted in full sun.	58,975.10	$1,371.58	72,377.10	$1,683.27	58,870.50	$12,050.78	200.9	$2,599.25
3	(28.0) Redbud, Eastern (Cercis canadensis) at 1.0 inch DBH.Planted 0-19 feet and north (0Â°) of buildings that were built post-1980 with heat and A/C.Trees are in excellent condition and planted in full sun.	59,362.10	$1,380.58	70,536.80	$1,640.47	60,573.60	$12,399.42	195.2	$2,525.55
4	(85.0) Sycamore, California (Platanus racemosa) at 1.5 inches DBH.Planted 20-39 feet and north (0Â°) of buildings that were built post-1980 with heat and A/C.Trees are in excellent condition and planted in full sun.	145,202.10	$3,376.95	172,030.40	$4,000.90	144,639.70	$29,607.74	496.2	$6,420.59
5	(101.0) Oak, Coastal live oak; California live (Quercus agrifolia) at 1.0 inch DBH.Planted 20-39 feet and north (0Â°) of buildings that were built post-1980 with heat and A/C.Trees are in excellent condition and planted in full sun.	327,037.70	$7,605.89	435,258.20	$10,122.76	279,556.60	$57,225.23	1,363.70	$17,646.15

Group Identifier	Tree Biomass (short ton)	Rainfall Interception (gallons)	Avoided Runoff (gallons)	Avoided Runoff ($)	O_3 Removed (pounds)	NO_2 Avoided (pounds)	NO_2 Removed (pounds)	SO_2 Avoided (pounds)	SO_2 Removed (pounds)	VOC Avoided (pounds)	PM2.5 Avoided (pounds)	PM2.5 Removed (pounds)
1	76.6	1,073,440.30	290,492.70	$2,595.84	1,293.40	8.9	298.5	31.4	20.7	64.4	40.6	12.1
2	18.6	193,694.00	52,417.20	$468.40	249	4.2	58.5	14.9	4	30.6	19.3	2.7
3	18.1	374,495.40	101,345.40	$905.62	430.2	4.3	98.2	15	6.9	31.4	19.8	3.7
4	43	947,979.00	256,540.60	$2,292.45	1,203.60	10.4	282	36.8	19.1	75.1	47.4	12.7
5	108.6	1,061,572.00	287,281.00	$2,567.14	1,431.30	23.5	362.6	82.8	25	147.4	92.2	17.9

ATTACHMENTS FOR SECTION 5.3.1:

Outreach and Engagement

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ATTACHMENTS FOR SECTION 5.3.2:

LOCAL SUPPORT

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Richard B. Francis
John R. Francis
Russell D. Francis

FRANCIS PROPERTY *Management*

July 7, 2022

Darin Seegmiller
Environmental Services Manager
City of Santa Clarita
23920 Valencia Boulevard
Valencia, CA 91355

Dear Mr. Seegmiller

On behalf of Cordova Estates, I would like to express our support for the Via Princessa Park and Regional BMP Project.

We believe the efforts of the City of Santa Clarita to develop this project will greatly improve the quality of life of the community. Specifically, this project will benefit the community through water quality improvement, creation of new recreational opportunities, increased water supply, and improved access to the Santa Clara River.

We support the City of Santa Clarita's approach to watershed enhancement and their mission to improve water conservation, water quality, and to provide greater access to open space and recreational opportunities within the watershed.

Ultimately, we believe that this project is consistent with the Safe Clean Water Program objectives and look forward to its development.

If you have any questions, please contact Nancy Must at (805) 495-9552.

Sincerely,

Nancy Must

Nancy Must, Regional Supervisor
Francis Property Management, Inc.

To: The City of Santa Clarita

I, Linda Peckham, am writing to express my support for the
name

proposed construction of the new 26-acre park located at 19201 Via Princessa. I agree that this new park will help expand the City's network of parks and include potential recreation amenities. I am also in favor of the new infiltration system that will capture and treat stormwater before it pollutes the Santa Clara River, which will also support the local groundwater supply.

Please reference the following reasons I believe our community will benefit from the proposed Via Princessa Park Project:

Any increase in open space for community activities is a bonus for the SCV. With the booming appeal of Pickleball this park would be an ideal location to build a multi court facility where tournaments could be held as well as City Leagues. Antelope Valley and Simi Valley already have or are developing PB facilities but the SCV is behind in this area.

Sincerely,

LINDA PECKHAM
printed name

7-14-22
date

Linda Peckham
signature

To: The City of Santa Clarita

I, Becky Amabisca, am writing to express my support for the proposed construction of the new 26-acre park located at 19201 Via Princessa. I agree that this new park will help expand the City's network of parks and include potential recreation amenities. I am also in favor of the new infiltration system that will capture and treat stormwater before it pollutes the Santa Clara River, which will also support the local groundwater supply.

Please reference the following reasons I believe our community will benefit from the proposed Via Princessa Park Project:

Good, natural environment to enjoy nature and walk - Good place for children & teens to play & socialize, Good place for use of water - Good p.r. for Canyon Country

Sincerely,

Becky Amabisca
printed name

7-14-22
date

Becky Amabisca
signature

To: The City of Santa Clarita

I, Susan Green (name), am writing to express my support for the proposed construction of the new 26-acre park located at 19201 Via Princessa. I agree that this new park will help expand the City's network of parks and include potential recreation amenities. I am also in favor of the new infiltration system that will capture and treat stormwater before it pollutes the Santa Clara River, which will also support the local groundwater supply.

Please reference the following reasons I believe our community will benefit from the proposed Via Princessa Park Project:

We need more parks. Not enough parks for children. It would be so beautiful and make our community nicer. Pickleball would be a plus. I have lived here since 1984 and would love to see this happen.

Sincerely,

Susan Green
printed name

7/14/2022
date

Susan Green
signature

To: The City of Santa Clarita

I, Anna Morales, am writing to express my support for the
name

proposed construction of the new 26-acre park located at 19201 Via Princessa. I agree that this new park will help expand the City's network of parks and include potential recreation amenities. I am also in favor of the new infiltration system that will capture and treat stormwater before it pollutes the Santa Clara River, which will also support the local groundwater supply.

Please reference the following reasons I believe our community will benefit from the proposed Via Princessa Park Project:

I believe it's important for these type of meetings to be announced at various SC Mom groups ~~of~~ on Facebook.

Sincerely,

Anna Morales
printed name

7/14/22
date

Anna Morales
signature

To: The City of Santa Clarita

I, Steven Rush, am writing to express my support for the proposed construction of the new 26-acre park located at 19201 Via Princessa. I agree that this new park will help expand the City's network of parks and include potential recreation amenities. I am also in favor of the new infiltration system that will capture and treat stormwater before it pollutes the Santa Clara River, which will also support the local groundwater supply.

Please reference the following reasons I believe our community will benefit from the proposed Via Princessa Park Project:

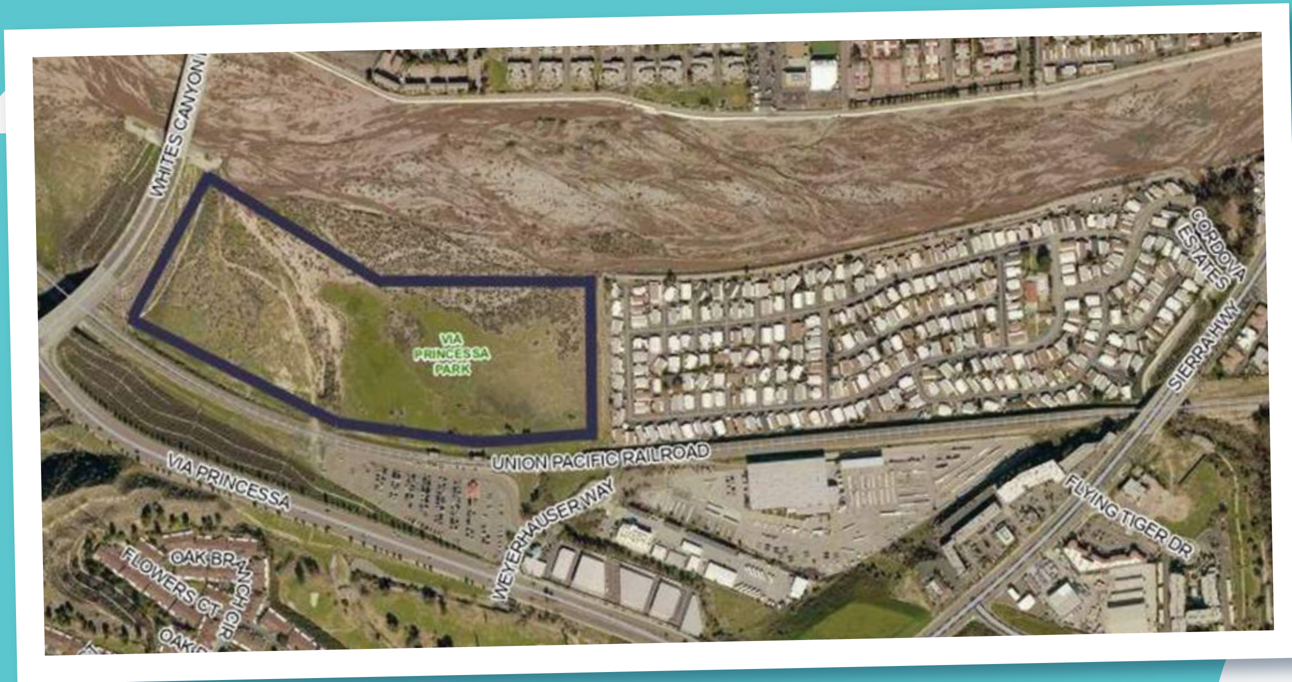
Good for the families who will use the facilities.

Sincerely,

Steven Rush
printed name

7/14/22
date

Steven Rush
signature



City of SANTA CLARITA

Via Princessa Park Community Engagement Open House

Thursday, July 14 from 5:30 – 7:30 p.m.
at the Canyon Country Community Center
18410 Sierra Highway

Join us to offer your feedback and ask questions regarding the proposed Via Princessa Park. Scan the QR code below or visit **city.sc/viaprincessasurvey1** to participate in a brief survey.

English

Español

City of Santa Clarita Government is in Santa Clarita, California.
Published by Instagram · July 7 at 2:12 PM ·

Community members are invited to offer their feedback at a Community Engagement Open House for the proposed Via Princessa Park next Thursday, July 14, from 5:30-7:30 p.m. at the Canyon Country Community Center located at 18410 Sierra Highway. You can also take an online survey regarding the proposed park at city.sc/viaprincessasurvey1. #santaclarita #parks #openhouse

See Insights
Boost post

40
14 Comments 19 Shares

Like Comment Share

Newest

Write a comment...

Venita Veloz-Ryan
More parks is always a good idea only concern is all the commuters from who knows where having easy access to children

Like Reply Hide Send Message 4d

Karen DeBrulye Cruze
Stupid site for a park - you have to cross railroad tracks to get there. Bordered by two very busy streets - and the river. Seriously?

Like Reply Hide 1w

Instagram

Search

cityofsantaclarita
Santa Clarita, California

cityofsantaclarita Community members are invited to offer their feedback at a Community Engagement Open House for the proposed Via Princessa Park next Thursday, July 14, from 5:30-7:30 p.m. at the Canyon Country Community Center located at 18410 Sierra Highway. You can also take an online survey regarding the proposed park at city.sc/viaprincessasurvey1. #santaclarita #parks #openhouse

1w

11donkeys Build something other

View insights

Liked by **scvsheriff** and **119 others**

7 DAYS AGO

Add a comment... Post

City invites community to open house on Via Princessa Park

NEWS RELEASE JULY 12, 2022 4:45 PM

Share Tweet Email

News release

The city of Santa Clarita is inviting community members to offer their feedback at a community engagement open house for the proposed Via Princessa Park on Thursday from 5:30 to 7:30 p.m. at the Canyon Country Community Center, located at 18410 Sierra Highway.

Community members are invited to offer their feedback and have their questions answered by city staff and project consultants.

LATEST NEWS

City Council approves Eternal Valley expansion, new landscaping contracts
JULY 14, 2022

Mother of girl who died on I-5 returns to court
JULY 14, 2022

SCV Water announces death of board member
JULY 14, 2022

L.A. County moves into "high" COVID tier
JULY 14, 2022

Inside
SCV News
SCV Sports
SCV Business
SCV Education
Arts & Culture
Op-Ed / Blogs
Things To Do
Extras
Earthquakes

July 14: City Requests Input for Via Princessa Park Project

Press Release | Friday, Jul 8, 2022

The city of Santa Clarita invites community members to offer their feedback at a Community Engagement Open House for the proposed Via Princessa Park on Thursday, July 14, from 5:30-7:30 p.m. at the Canyon Country Community Center located at 18410 Sierra Highway. Community members are invited to offer their feedback and have their questions answered by city staff and project consultants.

Earlier this year, the city proposed the construction of a brand new 26 acre park adjacent to the existing Via Princessa Metrolink Station located at 19201 Via Princessa. The proposed project will expand the city's network of parks with potential amenities, including multi-purpo fields, community gathering areas, trails and more. The proposed improvements also include an infiltration facility that will divert stormwate runoff and infiltrate into the nearby Santa Clara River, similar to the existing project underneath the Mercado at the new Canyon Country Community Center.

To help the city collect additional feedback, interested parties may also fill out a brief online survey regarding the proposed park. To learn more about the Via Princessa Community Engagement Open House, please contact Stormwater Compliance Administrator Heather Merenda at hmerenda@santa-clarita.com or (661) 255-1413.

Weather
Santa Clarita CA

Mostly cloudy
67°F

Calendar


Today in
S.C.V. History

July 12
1900 - Pacific Telephone & Telegraph establishes Newhall exchange; SCV gets first phone [story]

Comment On This Story
COMMENT POLICY: We welcome comments from individuals and businesses. All comments are moderated. Comments are subject to rej
vulgar, combative, or in poor taste.
REAL NAMES ONLY: All posters must use their real individual or business name. This applies equally to Twitter account holders who use

0 Comments

You can be the first one to leave a comment.

Leave a Comment

Name (required):

Email (required):

Website:

Add Comment

Latest Additions to SCVNews.com

[Valencia-Based H2scan Names David](#) | [Today in SCV History (July 12)](#) | [Monday COVID-Roundup: L.A.](#) | [July 25: SCV Water Invites Public for](#) | [Supervisors To Proposes Transfer of](#) | [Homebound Vaccines Available In L.A.](#)

MEETING SIGN-IN SHEET

Meeting Date:	July 14th, 2022	**Place/Room:**	Canyon Country Community Center
Project:	Via Princessa Park Community Open House		

NAME	ADDRESS	PHONE #	EMAIL	How did you hear about this event?
Eileen Willis	28380 Mt. Stephen Ave	(661) 212-0976	ewillis61@gmail.com	SCV Facebook / Ambassador
NATE BALSAM	17722 BENTLEY MANOR PL 91387	661 907 6311	NATE.BALSAM@GMAIL.COM	SCV FACEBOOK
Becky Amabisca	26784 Madigan C.C 91351	818-642-8532	ramabisca@socal.rr.com	Signal
Jonah Walter	27027 Weyerhaeuser Way	541-954-1437	jonah.walter@WY.com	FB / Signal
Don Cruikshank	23221 Haskell Vista Ln	661 8100199	Don@AVEquipment	Pres
Elaine Birgren	27900 Youngberry	661-373-6597	coachelaine@runskinco	Friend
Jerry Eisenberg	16512 Goodvale	661-298-3008	jerry.eisenberg@icloud.com	Pickleball
David Morrow	26920 Monterey	661-254-5295	dmorrow1452@gmail.com	scv facebook
LINDA PECKHAM	9809 Nurba Rd Agua Dulce	661-312-1678	mlpeckham@AOL.com	SCV Facebook Pickleball
PAOLA HOWARD		661-993-3119		Santa Clarita Runners

NAME	ADDRESS	PHONE #	EMAIL	How did you hear about this event?
Janet Cetrone	17719 Silverstream Dr. Cyn Cty	661 713-7237	cetrone3@yahoo.com	
Oanh Rusic	25537 Avenida Frasca, Valencia	661-312-9314	nguyenkimoanh70@yahoo.com	pickle ball embasson

NAME	ADDRESS	PHONE #	EMAIL	How did you hear about this event?
Steve Rush	25537 Averida Fresca	661-312-0670	stevensrusk@gmail.com	Pickle ball contacts
Albert ward	18619 ELDORADO COURT CANYON COUNTRY	310 330 6258	igotthecuts@yahoo.com	FACEBOOK
Anne Mordes	18619 El Dorado Ct Canyon Country 91351	(562) 441-9967	amodlesward@yahoo.com	Facebook pickle ball group.
Kristen Green	27747 Briarcliff Valencia CA	661 644 1328	Kgreen747@gmail	Pickleball contacts
Alan Zuckerman	25612 OAKBAR NEWHALL	818 359-4986	AZINVEST@AOL.COM	"
Jerry Charbonneau	18307 Oakmont dr. 91387	248 736-2328	gercharb@comcast.net	PA "
LARRY GONSALVES	21921 LYNETTE LN SANTA CLARITA	661/513-5367	LARRYGONSALVES@HOTMAIL.COM	PICKLEBALL

NAME	ADDRESS	PHONE #	EMAIL	How did you hear about this event?
MARLA THOMAS	23127 Yvette	661 3738589	Marla.Thomas54@icloud.com	pickleball Steve Ruske
JOANNE MODUGNO	21627 OAK ORCHARD Rd	661-373 0887	JOANNE.MODUGNO@gmail.com	FRIEND
John Coen	15210 Saddleback	661-233-1148	JackCoen1319@yahoo.com	ON-LINE

MEETING SIGN-IN SHEET

Meeting Date:	July 14th, 2022	**Place/Room:**	Canyon Country Community Center
Project:	Via Princessa Park Community Open House		

NAME	ADDRESS	PHONE #	EMAIL	How did you hear about this event?
Alan Willis	20380 Mt. Stephen Ave	661-644-8060	alanwillis01@gmail.com	Facebook
Beth Woll	23611 Canewell St Newhall, CA	818 426 4410	bethwoll@att.net	Dawn Coen
Melanie Cotterell	28072 Vernal Way Saugus, CA	661 607 1852	melanie.cotterell@sbcglobal.net	friend
Lisa Demaio	23131 Magnolia Glen Vala 91354	661 904 3896	LisaDemaio7@gmail.com	Friend
Mary Shirley	34358 Desert Rd Acton, CA 93510	661-618-4028	mary24fit@yahoo.com	friend / Pickleball
Rosanne Strach	26052 Amalie Ct Valencia CA. 91355	661 6186310	rstrach@aol.com	Pickleball
JJ Herrera	20021 Arrow Oaks 91321	805-365-2419	—	Pickleball
Dawn Coen	15210 Saddleback Rd. Canyon Cntry	661 644 4701	dawncoen@yahoo.com	Dawn Coen
FROLAINE TABING	19203 Ranier ST Canyon Country CA 91351	661-755-6165	frolainec@gmail.com	Dawn Coen / Pickleball

NAME	ADDRESS	PHONE #	EMAIL	How did you hear about this event?
Phil Howard	27105 Bidwell Ln Valencia CA 91354	661-993-3120	run2p@ca.rr.com	Running Community
Jason Mock	27838 Bloomfield Valencia 91354	661 313 1366	jason.mock@cnb.com	"
SANG YOO	23372 CAMFORD PL VALENCIA 91354	661.609.5680	SANGONEYOO@GMAIL.COM	PICKLEBALL COMMUNITY
Bobbi Constantine	20902 Judah Ln. Newhall CA 9135	661-435-1635	ilove2dnce@att.net	
Kyla deSouza	27710 Briarcliff Pl Valencia	310 430 3802	desouzaclan@gmail	Pickleball.
Sue Lederman	24360 Astor Racing Ct. Valencia	818-419-2969	ledermans@sbcglobal.net	Pickleball community
Jesse Montemayor	24412 CHERYL KELTON NEWHALL CAL	661 510-2780	JRRMONTEMAYO@AOL.COM	"
Rick Dinrell	24312 SPRINGER PL SANTA CLARITA CA	310-493-1585		STOPPED BY
Casey Rubin	17912 #2 River Circle C.C	661.510.1044	rubinbdcj@aol.com	pickleball friends
D Boone		6614721746	davel5211@sbcglobal.net	

SIGN UP FREE

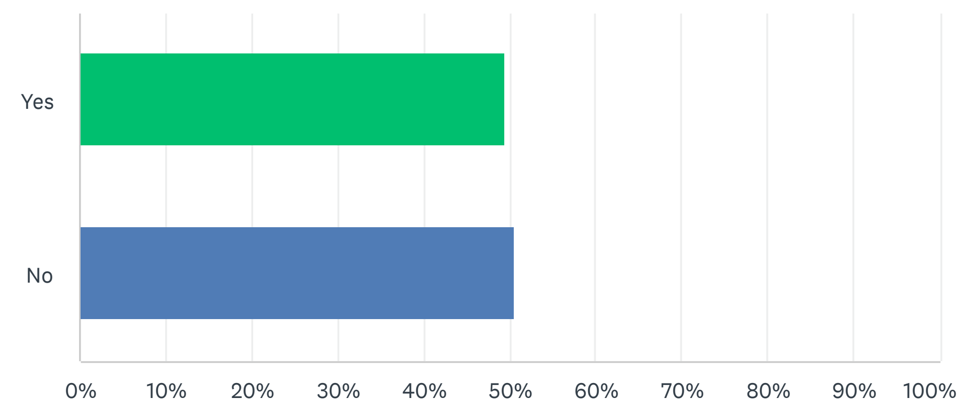
Via Princessa Park Survey

QUESTION SUMMARIES DATA TRENDS INDIVIDUAL RESPONSES

Q1

Are you aware that the City is planning a new park near the Via Princessa Metrolink Station? (19201 Via Princessa)

Answered: 160 Skipped: 0



ANSWER CHOICES	RESPONSES	
Yes	49.38%	79
No	50.63%	81

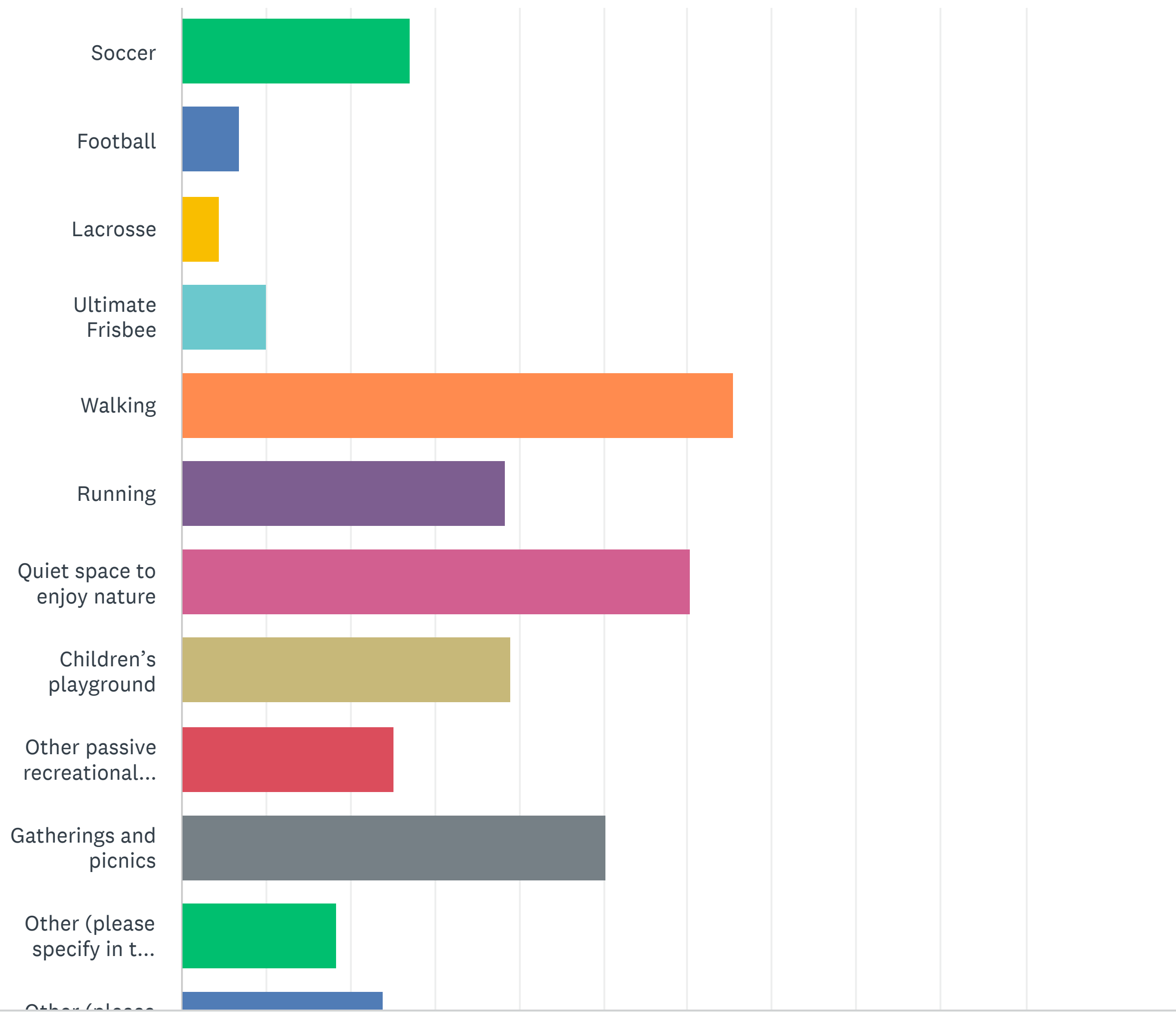
Share Link https://www.surveymonkey.com/re: COPY

160 responses

SIGN UP FREE

What activities would your family be interested in at the new City park? (select all that apply)

Answered: 159 Skipped: 1



Share Link https://www.surveymonkey.com/re COPY

160 responses

SIGN UP FREE

ANSWER CHOICES		RESPONSES	
Soccer		27.04%	43
Football		6.92%	11
Lacrosse		4.40%	7
Ultimate Frisbee		10.06%	16
Walking		65.41%	104
Running		38.36%	61
Quiet space to enjoy nature		60.38%	96
Children's playground		38.99%	62
Other passive recreational activities		25.16%	40
Gatherings and picnics		50.31%	80
Other (please specify in the text box below)		18.24%	29
Other (please specify in the text box below)	Responses	23.90%	38

Total Respondents: 159

Q3

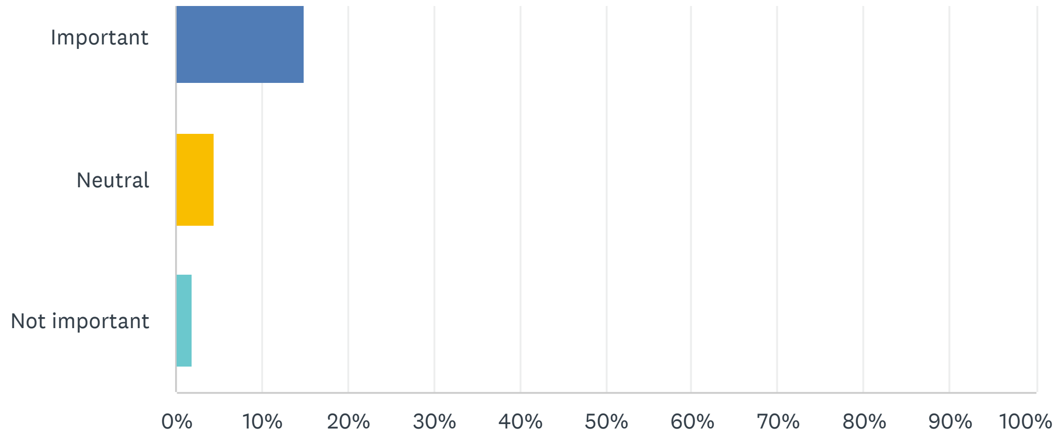
This proposed park will also include a project that will capture and clean stormwater, which will improve water quality for Santa Clarita residents. How important is water quality to you?

Answered: 160 Skipped: 0

Share Link https://www.surveymonkey.com/re: COPY

160 responses

SIGN UP FREE

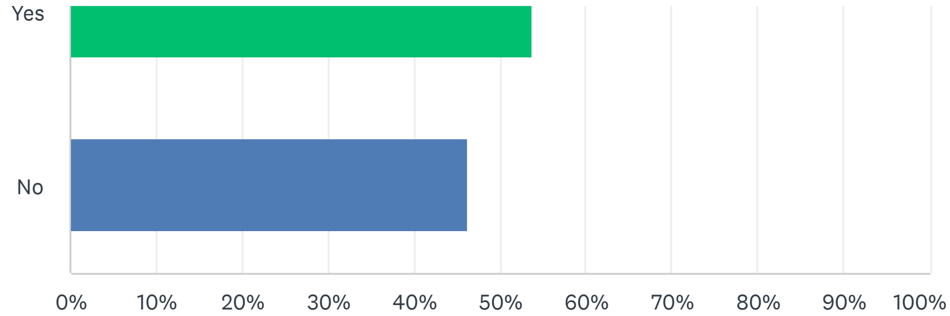


ANSWER CHOICES	RESPONSES	
Very important	78.75%	126
Important	15.00%	24
Neutral	4.38%	7
Not important	1.88%	3
TOTAL		**160**

Q4

The City will have a community engagement open house on July 14, 2022 at the Canyon Country Community Center. Would you be interested in attending to learn about the park and provide your feedback?

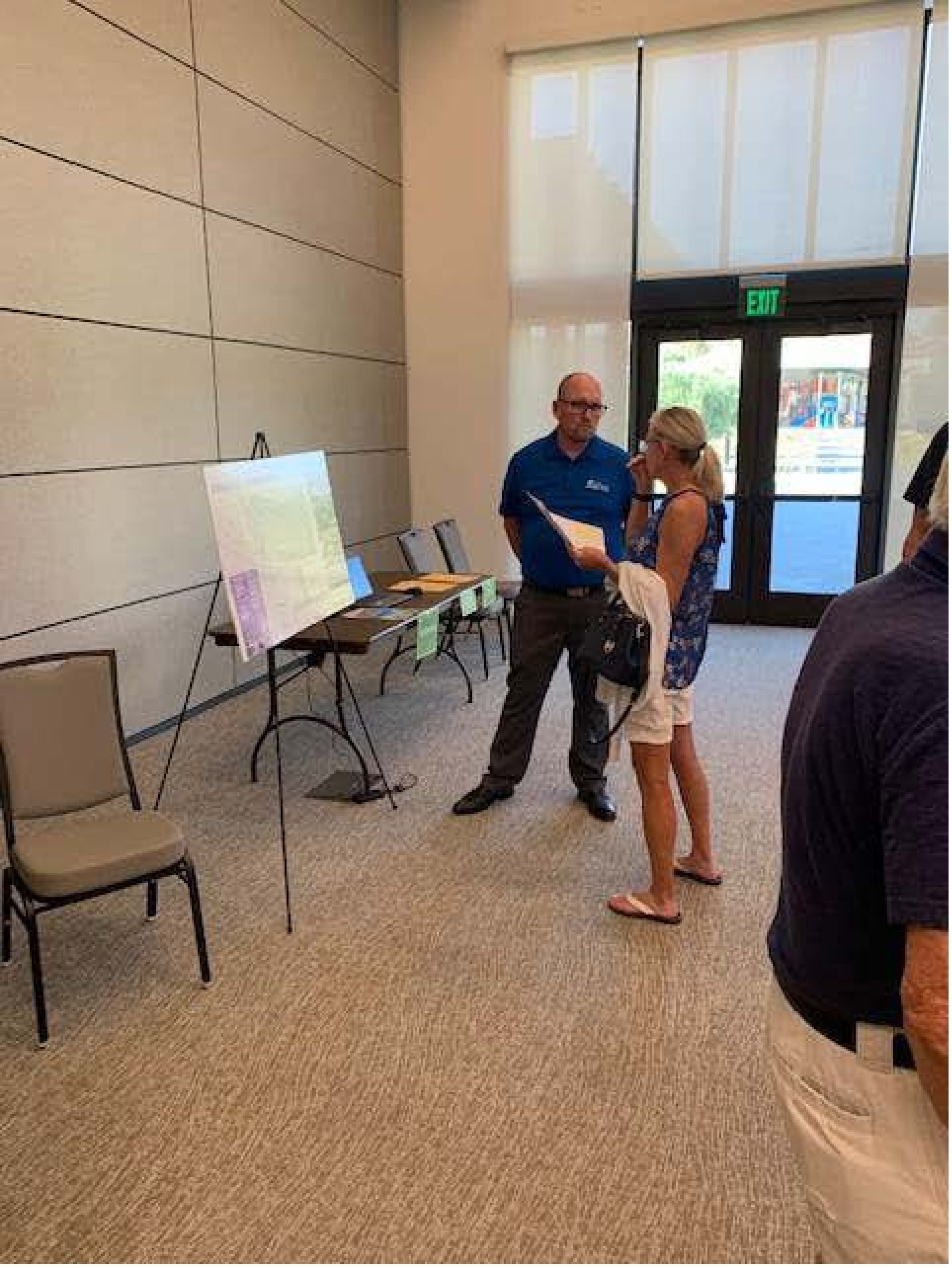
SIGN UP FREE



ANSWER CHOICES	RESPONSES	
Yes	53.80%	85
No	46.20%	73
TOTAL		**158**

Share Link https://www.surveymonkey.com/re COPY

160 responses


EXIT


REGIONAL STORMWATER
INFILTRATION BMP
REGIONAL
STORMWATER
BMP


EXIT
HEAD


City of
SANTA


EXIT
SIGN IN
SHEET


EXIT

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ATTACHMENTS FOR SECTION 6:

NATURE-BASED SOLUTIONS

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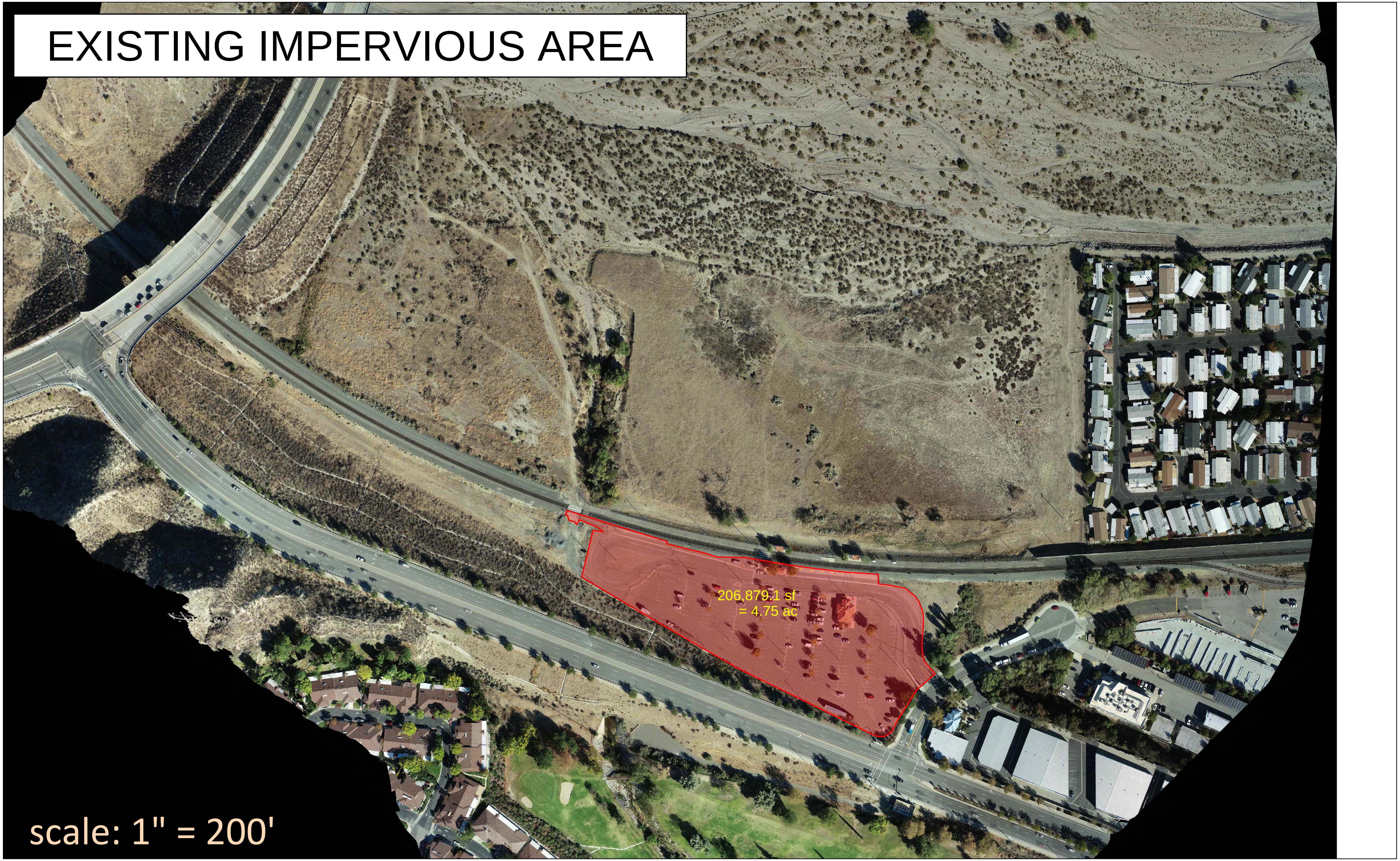
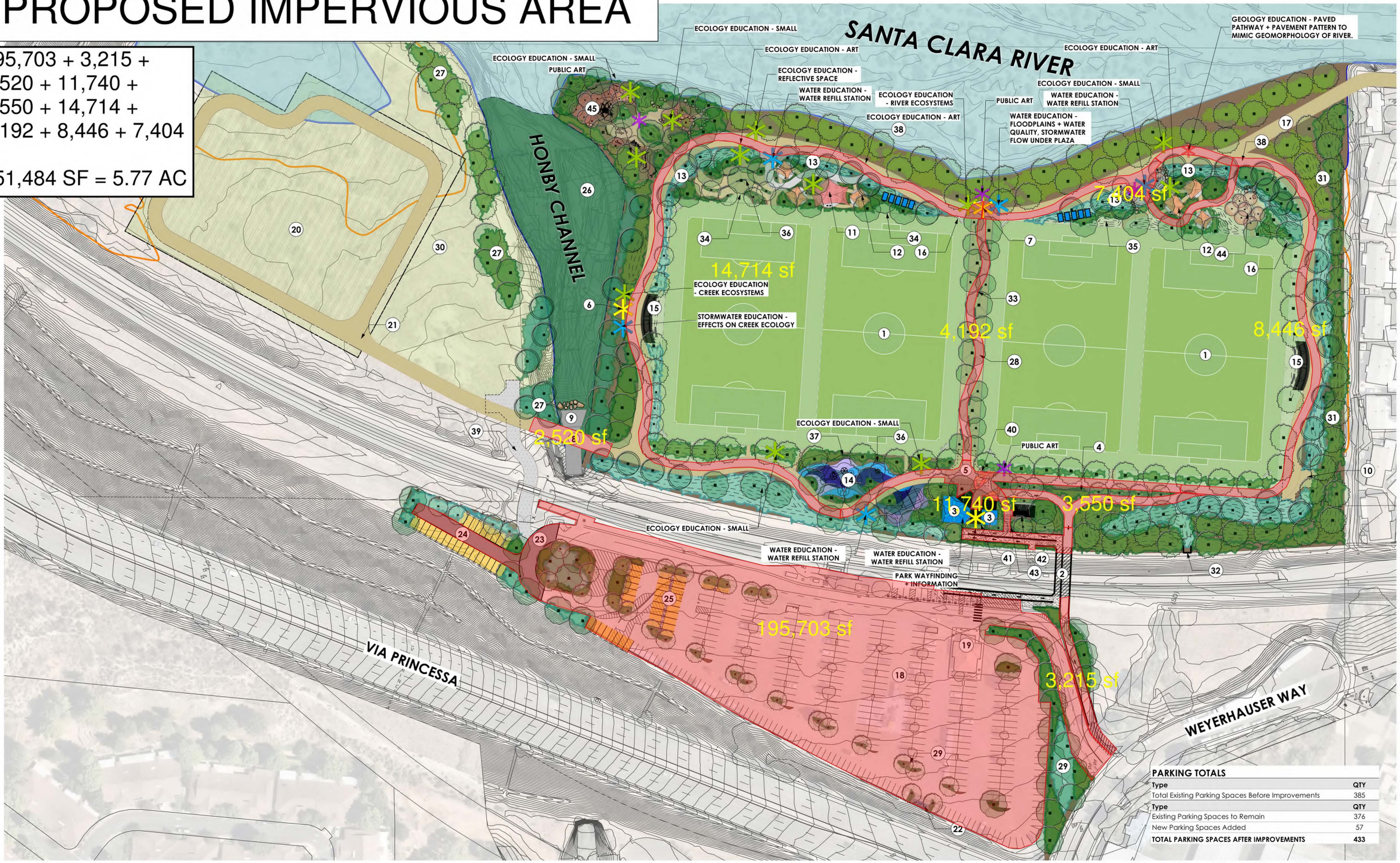
EXISTING IMPERVIOUS AREA



PROPOSED IMPERVIOUS AREA

195,703 + 3,215 +
2,520 + 11,740 +
3,550 + 14,714 +
4,192 + 8,446 + 7,404
=
251,484 SF = 5.77 AC



PARKING TOTALS	
Type	QTY
Total Existing Parking Spaces Before Improvements	385
Type	QTY
Existing Parking Spaces to Remain	376
New Parking Spaces Added	57
TOTAL PARKING SPACES AFTER IMPROVEMENTS	433

VIA PRINCESSA PARK CONCEPTUAL LANDSCAPE PLAN

Scale: 1" = 60'

0 60 120 180 240 300 FT

N

LANDSCAPE CONCEPTUAL PLAN - FULL SITE - SITE FEATURES

1. 180' X 300' MP FIELD WITH 25' BUFFER
2. PEDESTRIAN AND MAINTENANCE VEHICLE TUNNEL (RESTRICTED ACCESS FOR MAINTENANCE VEHICLES) WITH PUBLIC ART LIGHTING + MURALS
3. AMENITY BUILDINGS: 8 RESTROOM STALLS + SECURITY
4. 10' TALL RETAINING WALL + MONUMENT PARK SIGN AT ENTRY "VIA PRINCESSA PARK"
5. ENTRY GATHERING PLAZA WITH SHADE, PARK INFORMATIONAL KIOSK, PUBLIC ART + SEATING
6. WAYFINDING "HONBY CHANNEL" MONUMENT SIGN WITH EDUCATION
7. WAYFINDING "SANTA CLARA RIVER" PLAZA + MONUMENT SIGN WITH SHADE, SEATING + EDUCATION COMPONENTS
8. VEHICULAR ACCESS OVER HONBY CHANNEL
9. NEW EXTENDED CULVERT PER CIVIL
10. EMERGENCY VEHICLE HAMMERHEAD TURN-AROUND
11. SHADED PICNIC AREA (LARGE GROUPS)
12. SHADED PICNIC AREA (STANDARD GROUP)
13. NATURAL PLAY AREA INTEGRATED WITH STORMWATER BIOSWALES, STORMWATER COLLECTION SWALES DIRECTS STORMWATER TO BMP INTAKE
14. NATURE THEMED PLAYGROUND
15. SHADED BERM SEATING
16. SPORTS FIELD LIGHTING
17. BANK LINER
18. EXISTING VIA PRINCESSA STATION PARKING LOT WITH 400 PARKING SPACES
19. EXISTING RESTROOM + SECURITY FACILITY
20. SUBGRADE INFILTRATION WELL BMP
21. MAINTENANCE VEHICLE ACCESS ROAD
22. NEW TRASH ENCLOSURE FOR (3) 5 YD DUMPSTERS
23. NEW BUS TURNAROUND, NEW ASPHALT
24. NEW PARKING AISLE WITH NEW PARKING SPACES, LANDSCAPE AREAS AND NEW FENCE AROUND PERIMETER
25. NEW PARKING STALLS
26. HONBY CHANNEL RESTORATION
27. LANDSCAPE AREA TO HELP PROMOTE NATURAL SUCCESSION OF PLANTING ON THE WEST SIDE OF HONBY CHANNEL
28. CENTRAL ACCESSIBLE PATH WITH SHADE AND SEATWALLS
29. NEW LANDSCAPE AREAS
30. DESERT SCRUB HYDROSEED MIX - THESE PLANTS DON'T NEED IRRIGATION AFTER ESTABLISHMENT
31. CORDOVA ESTATES PLANTED BUFFER
32. EXISTING STORM OUTLET
33. SEATWALL
34. SPECTATOR TURF CUTOUTS
35. SPECTATOR BERM SEATING
36. RETAINING SEATWALLS
37. SPLIT-RAIL FENCING AROUNG PLAYGROUND
38. SERVICE VEHICLE ACCESS LOOP DOUBLES AS BANK LINER ALONG NORTH AND WEST SIDE OF PROPERTY, ALSO SERVES AS MULTI-MODAL PATHWAY, MIMICKING THE SHAPE AND GEOMORPHOLOGY OF RIVERS
39. SERVICE VEHICLE AT-GRADE CROSSING WITH HAMMERHEAD TURN-AROUND
40. CRISS-CROSS CANVAS SHADE STRUCTURES
41. WOODEN SHADE STRUCTURES
42. SHADED BIKE PARKING AND BIKE AMENITIES
43. ARCHWAY ENTRY WALK
44. PLAY BERMS
45. NATURAL PLAYGROUND

SITE PLAN COLOR KEY

LANDSCAPE AREAS + HARDSCAPES

- LOW WATER ADAPTIVE PLANTING SLOPES
- LOW WATER ADAPTIVE PLANTING
- BIOSWALES
- LOW-MOW LAWN
- DECOMPOSED GRANITE/COMPACTED DIRT
- VEHICULAR CONCRETE
- CONCRETE PAVERS

CIRCULATION + SYMBOLOGY

- WATER TUNNEL EDUCATION + ART PIECE
- WATER EDUCATION + PUBLIC ART OPPORTUNITY
- ECOLOGY + STEWARDSHIP EDUCATION + PUBLIC ART OPPORTUNITY
- GEOLOGY EDUCATION OPPORTUNITY
- WAYFINDING
- PUBLIC ART

461 East Main Street, Ventura, CA 93001
805.644.9697 www.pc-ld.com

client:
CITY OF SANTA CLARITA
23920 VALENCIA BLVD.
SANTA CLARITA, CA 91355

revisions:
No. Date Revision Notes

issues:
No. Date Issue Notes

project:

VIA PRINCESSA PARK CONCEPT PLAN
VIA PRINCESSA PARK
SANTA CLARITA, CA 91321

plot date:
drawn by:
checked by:
PCLD project #: 21-020
File Name: 21-020_L-Project.vwx

CONCEPTUAL LANDSCAPE PLAN -PACE COORDINATION -ANNO

EX-09

ATTACHMENTS FOR SECTION 7.1:

COST & SCHEDULE

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Item No.	Description	Qty	Unit	Unit $	Cost
1*	CMP Infiltration gallery, Diversion line, Diversion Structure, HDS (includes equipment, material, labor, installation, contingency, contractor overhead and profit, bonding & insurance, and sales tax)	1	LS	$ 11,055,619	$ 11,055,619
2	BMP, Div. line, Div. structure, HDS O&M (life cycle)	1	LS	$ 569,817	$ 569,817
3	Monitoring (life cycle)	1	LS	$ 150,000	$ 150,000
4	Triple RC Box Extension & Outlet Structure	1	LS	$ 570,000	$ 570,000
5	Education components	1	LS	$ 100,000	$ 100,000
6	Trees - 36" Box (Parking Lot)	59	ea	$ 1,200	$ 70,800
7	Shrub Planting - swales (Parking Lot)	7,236	sf	$ 5	$ 36,180
8	New shrub and tree irrigation (Parking Lot)	28,530	sf	$ 7	$ 199,710
9	New shrub and tree irrigation (Park)	239,973	sf	$ 7	$ 1,679,811
10	Shrub Planting - swales (Park)	74,306	sf	$ 4.50	$ 334,377
11	Shrub Planting - riparian restoration	68,559	sf	$ 4.50	$ 308,516
12	Trees - 24" box (Park)	75	ea	$ 450	$ 33,750
13	Trees - 36" box (Park)	175	ea	$ 1,200	$ 210,000
14	Hydroseed (west side)	175,920	sf	$ 0.50	$ 87,960
15	Storm drain pipe (Park)	1,660	lf	$ 140	$ 232,400
16	BBQs (1 per 35x35; 2 per 60x30)	10	ea	$ 300	$ 3,000
17	Picnic Tables (4 per 35x35; 9 per 60x30)	37	ea	$ 2,000	$ 74,000
18	Group picnic shelter (60x30) includes lighting	1	ea	$ 82,000	$ 82,000
19	Group picnic shelter (30x30) includes lighting	7	ea	$ 50,000	$ 350,000
20	Play structures	1	LS	$ 800,000	$ 800,000
21	Natural play components	1	LS	$ 500,000	$ 500,000
22	Shade sails over play structures (60x30)	2	ea	$ 80,000	$ 160,000
23	Shade sails over play structures (30x30)	4	ea	$ 50,000	$ 200,000
24	Play surfacing (pip rubberized surface)	14,190	sf	$ 25	$ 354,750
25	Playground lighting (18' Ht. Pole on 3' Ht. Conc. Base, LED, Assumes 1 every 80 LF)	8	ea	$ 5,000	$ 40,000
26	Path lighting (18' Ht. pole on 3' Ht. Conc. Base, LED, Assumes 1 every 80 LF)	36	ea	$ 5,000	$ 180,000
27	Sports Turf (sod)	315,651	sf	$ 0.60	$ 189,391
28	Turf Recreational Hydroseed	44,599	sf	$ 0.50	$ 22,300
29	Entry monument sign	1	LS	$ 15,000	$ 15,000
30	Wayfinding	1	LS	$ 25,000	$ 25,000
31	Public Art	1	LS	$ 50,000	$ 50,000
32	Drinking Fountains (Assume 2 at plazas, 2 near fields, 2 on trail)	6	ea	$ 8,000	$ 48,000
33	Bike Racks (at picnic area and entry plaza)	2	ea	$ 800	$ 1,600
34	Benches (Assume 1 every 200 LF along sidewalk & near sports fields)	25	ea	$ 1,000	$ 25,000
35	Large shade sail (60x30)	1	ea	$ 80,000	$ 80,000
36	Small shade sail (30x0)	4	ea	$ 50,000	$ 200,000
37	Concrete Pavers (plaza spaces and path crossings)	6,700	sf	$ 24	$ 160,800
38	Stabilized soil trails - 5' width (hardscape)	15,060	sf	$ 6	$ 90,360
				Subtotal =	$ 19,290,140
				Contingencies =	$ 708,629
				Total =	**$ 19,998,768**

*For breakdown of BMP cost estimate, see Page 2

Contingency not applied to BMP since contingencies are built into the lump sum (see breakdown on page 2 for details)

Contingency not applied to BMP O&M or BMP Monitoring costs

Conceptual Stormwater Infiltration Facility Evaluation - Via Princessa Park							
Preliminary Cost Estimate - Corrugated Metal Pipe Infiltration System - Honby Channel Watershed							
8' Dia. CMP - Total Storage Provided = 11.0 acre feet (30.1 ac-ft infiltration)							
	Item	**Unit**	**Quantity**	**Unit Price**		**Total**	
General Conditions						**$**	**607,106**
Demolition						**$**	**1,182,896**
1	Total Excavation Cost	per Cu. Yard	96,800	$	4	$	387,200
2	Total Fill Cost	per Cu. Yard	53,724	$	10	$	537,240
3	Total Exported Cost	per Cu. Yard	43,076	$	6	$	258,456
Civil & Mechanical - Equipment & Material						**$**	**3,491,545**
1	Corrugated Steel Pipe Infiltration System Including Risers, Stub(s), and Geotextile Liner	LS	1	$	1,375,000	$	1,375,000
3	Porous Backfill Material	per Cu. Yard	35,119	$	45	$	1,580,345
4	Hydrodynamic Separator (3x AS-13 in parallel) Fully Assembled, Delivered to Job Site	LS	1	$	262,500	$	262,500
5	Diversion Line	per L.F.	474	$	50	$	23,700
6	Diversion Structure	LS	1	$	250,000	$	250,000
Civil & Mechanical - Labor and Installation						**$**	**1,396,618**
1	Install Corrugated Metal Pipe Infiltration System	LS	1	$	1,396,618	$	1,396,618
Subtotals and Fees							
	Demolition, Civil & Mechanical - Equipment and Material, Civil & Mechanical - Labor and Installation Subtotal					**$**	**6,071,059**
	General Conditions Subtotal					**$**	**607,106**
		25%			Contingency	$	1,669,541
	Subtotal "A"					**$**	**8,347,706**
	Applied to A	25%			(B) Contractor Overhead & Profit	$	2,086,927
	Applied to (A + B)	3%			Bonding and Insurance	$	313,038.99
	***Applied only to Equipment & Materials**	9.5%			*Sales Tax	$	307,947
Total						**$**	**11,055,619**
Cost per Acre-Feet of Infiltrated Runoff						**$**	**367,296**

Annual Maintenance			
Activity	**Cost**	**Frequency/yr**	**Total Cost**
Vacuum CDS & Silt Removal from CMP	$ 1,500	4	$ 10,000
Vegetation Clearing - Honby Channel	$ 8,364	2	$ 16,800
Pest control matinenance	$ 42	4	$ 170
		Total Cost/yr =	$ 27,000
Annual Operation			
Activity	**Cost**	**Frequency/yr**	**Total Cost**
	$ -	0	$ -
Annual Monitoring			
Activity	**Cost**	**Frequency/yr**	**Total Cost**
Sample/test for pollutants	$ 350	3	$ 3,000
Total =	**$ 29,970**	**/yr**	

Design Cost Estimate

Via Princessa Park - P3033

Design Team	$3,964,832.00
10% Contingency	$396,483
Design Total	$4,361,315
City Total Soft Cost	$2,193,513
Grand Project Total	$6,554,828

ATTACHMENTS FOR SECTION 7.2:

COST SHARE

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Background Info on Prop A Funding

LOS ANGELES COUNTY
REGIONAL PARK AND
OPEN SPACE DISTRICT

RPOSD.lacounty.gov
ParksProjects.lacounty.org
twitter.com/RPOSD

510 South Vermont Avenue • Room 230 • Los Angeles • CA 90020-1975 (213) 738-2981

February 22, 2017

Mr. Wayne Weber
Parks Planning Manager
City of Santa Clarita
23920 Valencia Boulevard, Suite 120
Santa Clarita, CA 91355

Dear Mr. Weber:

Via Princessa Park Development Project
Grant No. 58J4-17-2644

Enclosed for your file is the Project Agreement that has been executed. Please make all payments and send all remaining documents to the District before the project expiration date or notify me if there will be a delay.

I look forward to working with you and your staff to complete this project. If you have any questions, or need additional information or forms, please feel free to call me at (213) 738-2557 or via email at aablaza@parks.lacounty.gov.

Sincerely,

Albert Ablaza
Program Manager

(Enclosure: 1 Original)

Background Info on Measure A Funding

LOS ANGELES COUNTY REGIONAL PARK AND OPEN SPACE DISTRICT

MEASURE A

Available Funding of Annual Allocations

Category 1 and 2

Please note, balances may not reflect commitments made in the last 2-3 weeks

As of 06/07/2022

Study Area Name	SA #	Year.Category	Allocation	Committed	Uncommitted
Agoura Hills - Agoura Hills	**81**	2018.1	$ 77,429.85	$ 77,429.85	$ -
		2019.1	$ 80,942.16	$ 80,942.16	$ -
		2020.1	$ 87,430.15	$ 87,430.15	$ -
		2021.1	$ 87,443.71	$ 46,008.70	$ 41,435.01
Agoura Hills - Agoura Hills Total			**$ 333,245.87**	**$ 291,810.86**	**$ 41,435.01**
Alhambra - Alhambra	**82**	2018.1	$ 254,348.25	$ -	$ 254,348.25
		2018.2	$ 191,665.78	$ -	$ 191,665.78
		2019.1	$ 265,885.79	$ -	$ 265,885.79
		2019.2	$ 200,359.98	$ -	$ 200,359.98
		2020.1	$ 287,198.12	$ -	$ 287,198.12
		2020.2	$ 216,420.02	$ -	$ 216,420.02
		2021.1	$ 287,242.65	$ -	$ 287,242.65
		2021.2	$ 216,453.57	$ -	$ 216,453.57
Alhambra - Alhambra Total			**$ 1,919,574.16**	**$ -**	**$ 1,919,574.16**
Arcadia - Arcadia	**166**	2018.1	$ 204,048.98	$ -	$ 204,048.98
		2019.1	$ 213,304.89	$ -	$ 213,304.89
		2020.1	$ 230,402.55	$ -	$ 230,402.55
		2021.1	$ 230,438.27	$ -	$ 230,438.27
Arcadia - Arcadia Total			**$ 878,194.69**	**$ -**	**$ 878,194.69**
Artesia - Artesia	**40**	2018.1	$ 49,541.62	$ -	$ 49,541.62
		2018.2	$ 37,254.35	$ -	$ 37,254.35
		2019.1	$ 51,788.89	$ -	$ 51,788.89
		2019.2	$ 38,944.25	$ -	$ 38,944.25
		2020.1	$ 55,940.08	$ -	$ 55,940.08
		2020.2	$ 42,065.87	$ -	$ 42,065.87
		2021.1	$ 55,948.75	$ -	$ 55,948.75
		2021.2	$ 42,072.39	$ -	$ 42,072.39
Artesia - Artesia Total			**$ 373,556.20**	**$ -**	**$ 373,556.20**
Avalon - Avalon / UI Channel Island North	**53**	2018.1	$ 13,857.87	$ -	$ 13,857.87
		2019.1	$ 14,486.48	$ -	$ 14,486.48
		2020.1	$ 15,647.66	$ -	$ 15,647.66
		2021.1	$ 15,650.09	$ -	$ 15,650.09
Avalon - Avalon / UI Channel Island North Total			**$ 59,642.10**	**$ -**	**$ 59,642.10**
Azusa - Azusa	**175**	2018.1	$ 141,131.02	$ 141,131.02	$ -
		2019.1	$ 147,532.90	$ 147,532.90	$ -
		2020.1	$ 159,358.53	$ 98,759.28	$ 60,599.25
		2021.1	$ 159,383.24	$ -	$ 159,383.24
Azusa - Azusa Total			**$ 607,405.69**	**$ 387,423.20**	**$ 219,982.49**
Baldwin Park - Baldwin Park	**54**	2018.1	$ 209,190.07	$ -	$ 209,190.07
		2018.2	$ 155,329.74	$ -	$ 155,329.74
		2019.1	$ 218,679.18	$ -	$ 218,679.18
		2019.2	$ 162,375.69	$ -	$ 162,375.69
		2020.1	$ 236,207.62	$ -	$ 236,207.62
		2020.2	$ 175,391.06	$ -	$ 175,391.06
		2021.1	$ 236,244.24	$ -	$ 236,244.24
		2021.2	$ 175,418.25	$ -	$ 175,418.25
Baldwin Park - Baldwin Park Total			**$ 1,568,835.85**	**$ -**	**$ 1,568,835.85**
Bell - Bell	**71**	2018.1	$ 98,909.73	$ 98,909.73	$ -
		2018.2	$ 73,509.97	$ 73,509.97	$ -
		2019.1	$ 103,396.40	$ 561.87	$ 102,834.53
		2019.2	$ 76,844.47	$ 76,844.47	$ -
		2020.1	$ 111,684.23	$ -	$ 111,684.23
		2020.2	$ 83,004.02	$ -	$ 83,004.02
		2021.1	$ 111,701.55	$ -	$ 111,701.55
		2021.2	$ 83,016.88	$ -	$ 83,016.88
Bell - Bell Total			**$ 742,067.25**	**$ 249,826.04**	**$ 492,241.21**
Bell Gardens - Bell Gardens	**114**	2018.1	$ 109,857.52	$ -	$ 109,857.52
		2018.2	$ 80,795.35	$ -	$ 80,795.35
		2019.1	$ 114,840.80	$ -	$ 114,840.80

		2021.1	$ 58,369.21	$ -	$ 58,369.21
San Marino - San Marino Total			**$ 222,443.64**	**$ -**	**$ 222,443.64**
Santa Clarita - North	**179**	2018.1	$ 404,688.40	$ -	$ 404,688.40
		2019.1	$ 423,045.56	$ -	$ 423,045.56
		2020.1	$ 456,955.18	$ -	$ 456,955.18
		2021.1	$ 457,026.02	$ -	$ 457,026.02
Santa Clarita - North Total			**$ 1,741,715.16**	**$ -**	**$ 1,741,715.16**
Santa Clarita - South	**151**	2018.1	$ 309,211.84	$ -	$ 309,211.84
		2019.1	$ 323,238.07	$ -	$ 323,238.07
		2020.1	$ 349,147.52	$ -	$ 349,147.52
		2021.1	$ 349,201.65	$ -	$ 349,201.65
Santa Clarita - South Total			**$ 1,330,799.08**	**$ -**	**$ 1,330,799.08**
Santa Fe Springs - Santa Fe Springs	**126**	2018.1	$ 138,080.23	$ 138,080.23	$ -
		2019.1	$ 144,343.71	$ 144,343.71	$ -
		2020.1	$ 155,913.72	$ 155,913.72	$ -
		2021.1	$ 155,937.89	$ 8,237.22	$ 147,700.67
Santa Fe Springs - Santa Fe Springs Total			**$ 594,275.55**	**$ 446,574.88**	**$ 147,700.67**
Santa Monica - Santa Monica	**182**	2018.1	$ 335,441.62	$ -	$ 335,441.62
		2019.1	$ 350,657.66	$ -	$ 350,657.66
		2020.1	$ 378,764.95	$ -	$ 378,764.95
		2021.1	$ 378,823.68	$ -	$ 378,823.68
Santa Monica - Santa Monica Total			**$ 1,443,687.91**	**$ -**	**$ 1,443,687.91**
Sierra Madre - Sierra Madre	**112**	2018.1	$ 37,671.69	$ -	$ 37,671.69
		2019.1	$ 39,380.52	$ -	$ 39,380.52
		2020.1	$ 42,537.10	$ -	$ 42,537.10
		2021.1	$ 42,543.70	$ -	$ 42,543.70
Sierra Madre - Sierra Madre Total			**$ 162,133.01**	**$ -**	**$ 162,133.01**
Signal Hill - Signal Hill	**141**	2018.1	$ 43,499.34	$ -	$ 43,499.34
		2019.1	$ 45,472.52	$ -	$ 45,472.52
		2020.1	$ 49,117.42	$ -	$ 49,117.42
		2021.1	$ 49,125.03	$ -	$ 49,125.03
Signal Hill - Signal Hill Total			**$ 187,214.31**	**$ -**	**$ 187,214.31**
South El Monte - South El Monte / UI El Monte / UI Whittier	**78**	2018.1	$ 77,962.44	$ -	$ 77,962.44
		2019.1	$ 81,498.91	$ -	$ 81,498.91
		2020.1	$ 88,031.54	$ -	$ 88,031.54
		2021.1	$ 88,045.18	$ -	$ 88,045.18
South El Monte - South El Monte / UI El Monte / UI Whittier Total			**$ 335,538.07**	**$ -**	**$ 335,538.07**
South Gate - South Gate	**88**	2018.1	$ 263,072.17	$ -	$ 263,072.17
		2018.2	$ 195,454.18	$ -	$ 195,454.18
		2019.1	$ 275,005.45	$ -	$ 275,005.45
		2019.2	$ 204,320.22	$ -	$ 204,320.22
		2020.1	$ 297,048.77	$ -	$ 297,048.77
		2020.2	$ 220,697.70	$ -	$ 220,697.70
		2021.1	$ 297,094.82	$ -	$ 297,094.82
		2021.2	$ 220,731.92	$ -	$ 220,731.92
South Gate - South Gate Total			**$ 1,973,425.23**	**$ -**	**$ 1,973,425.23**
South Pasadena - South Pasadena	**89**	2018.1	$ 83,770.73	$ -	$ 83,770.73
		2019.1	$ 87,570.67	$ -	$ 87,570.67
		2020.1	$ 94,589.98	$ -	$ 94,589.98
		2021.1	$ 94,604.65	$ -	$ 94,604.65
South Pasadena - South Pasadena Total			**$ 360,536.03**	**$ -**	**$ 360,536.03**
Temple City - Temple City	**28**	2018.1	$ 109,043.70	$ -	$ 109,043.70
		2018.2	$ 82,186.18	$ -	$ 82,186.18
		2019.1	$ 113,990.05	$ -	$ 113,990.05
		2019.2	$ 85,914.24	$ -	$ 85,914.24
		2020.1	$ 123,127.03	$ -	$ 123,127.03
		2020.2	$ 92,800.78	$ -	$ 92,800.78
		2021.1	$ 123,146.12	$ -	$ 123,146.12
		2021.2	$ 92,815.17	$ -	$ 92,815.17
Temple City - Temple City Total			**$ 823,023.27**	**$ -**	**$ 823,023.27**
Torrance - North	**174**	2018.1	$ 227,893.15	$ -	$ 227,893.15
		2018.2	$ 174,871.03	$ -	$ 174,871.03
		2019.1	$ 238,230.66	$ -	$ 238,230.66
		2019.2	$ 182,803.39	$ -	$ 182,803.39
		2020.1	$ 257,326.26	$ -	$ 257,326.26
		2020.2	$ 197,456.17	$ -	$ 197,456.17
		2021.1	$ 257,366.15	$ -	$ 257,366.15
		2021.2	$ 197,486.79	$ -	$ 197,486.79
Torrance - North Total			**$ 1,733,433.60**	**$ -**	**$ 1,733,433.60**
Torrance - South	**181**	2018.1	$ 279,790.41	$ -	$ 279,790.41

IRWM Prop 1 Round 2 Funding-
Background Info

Heather Merenda

From: Lauren Everett <LaurenEverett@kennedyjenks.com>
Sent: Monday, July 18, 2022 9:52 AM
To: Heather Merenda
Subject: RE: Via Princessa on Round 2 List for Consideration
Attachments: USCR Project_Info_LongForm_IRWM Round 2_2022_UPDATEDTemplate.docx; USCR IRWM Project Idea Submission Form_2022_Template.xls

Good morning!

We are going to send out an email today (maybe tomorrow) for the next Stakeholder meeting and our call for projects. But I'll give you the info first!

All projects must submit a new project form (both are attached). Please use the long-form if you are seeking funding for Via Princessa and/or others. The short form can be used to ensure the project it included in the IRWM Plan itself. Send by August 22nd.

Let me know if you have any questions….

Hope you are well and looking forward to seeing you on zoom on the 28th!

Lauren

From: Heather Merenda <HMERENDA@santa-clarita.com>
Sent: Monday, July 18, 2022 8:48 AM
To: Cheryl Fowler <cfowler@scvwa.org>; Lauren Everett <LaurenEverett@kennedyjenks.com>
Subject: Via Princessa on Round 2 List for Consideration

Good morning

Could you please email me the excel spread sheet showing the projects under consideration for Round 2 funding that includes Via Princessa? Thank you

Heather Merenda, MPA
LEED Professional, CPSWQ, QSP
Environmental Services Division
City of Santa Clarita
23920 Valencia Blvd.
Santa Clarita, CA 91355

Phone: (661) 284-1413
Mobile: (661)607-1904
Email: hmerenda@santa-clarita.com
Web: www.greensantaclarita.com; www.santa-clarita.com

$1.5M Municipal Funding- Background Info

Safe Clean Water Measure W - Municipal Share Annual Spending Plan
City of Santa Clarita
Funds to be Spent FY 21-22 (Collected FY 20-21)

The follow descriptions are part of the requirements in "EXHIBIT A ANNUAL PLAN CONTENTS" in the Fund Transfer Agreement for the municipal share of the Safe Clean Water Measure W funds. The description includes projects, programs, operations and maintenance, stakeholder engagement, monitoring and ISI certification. The required A-7 budget table is included.

A-1 Projects

A-1. Description of all projects anticipated to be funded using the SCW Program Payment. Include a discussion of how the projects will result in the achievement of one or more SCW Program Goals, including quantitative targets and corresponding metrics for subsequent reporting of all applicable parameters.

The City of Santa Clarita in located in the Upper Santa Clara River Watershed. The Safe Clean Water funding for FY 21-22 allocation for the City will be used towards design and construction of projects that are in various stages. Via Princessa/Site X is being requested to more comprehensively move design forward as there are many elements of the project that require attention. Full capture trash devices will continue to be constructed during FY 21-22. The City will evaluate up to four new projects from the updated EWMP document that should be completed by June 30, 2021. The projects and their achievement of Safe Clean Water Measure W program goals are summarized in the table below.

	Safe Clean Water Measure W Program Goals				
Projects Anticipated to be Funded v	Water Quality	Water Supply	Community Investment	Nature Based Solution	Leverage Funds
Via Princessa/Site X - Design	o	o	o	o	o
Full Capture Devices/Trash Policy Installation	o				
Four Project Site from EWMP Concept Evaluation	o	o	o	o	o

Design of Via Princessa Park/Site X

Now a vacant, city-owned parcel, Via Princessa Park is envisioned with a below-ground storm water capture system directly adjacent to the River. The park, located in the Canyon Country area, would provide new recreation opportunities for a Disadvantaged Community (DAC) directly adjacent to the property.

- ✓ Captures pollutants from the entire drainage area
- ✓ Replenishes local groundwater and provides potable water storage
- ✓ Reduces risk of flooding downstream

The infiltration facility has a 998-acre capture area. A hydrodynamic separator will provide pretreatment of trash and sediment before flows enter a second system that will funnel up to 35.9-acre feet of storm water for capture and infiltration with some natural surface feature envisioned. The project could capture and treat almost twice the 85th percentile, 24-hour design storm event. Above ground, a new park concept may include multipurpose fields, shade trees and a dry-creek bed drainage feature. To date, cone penetration testing completed and shows excellent sandy-soil for infiltration. Desktop review of groundwater shows groundwater is high only in very wet years. Phase 1 Environmental demonstrates no issues. However, there is Railroad Authority that requires analysis and buy in for railroad crossing issues. This design would attain Enhanced Watershed Management Plan (EWMP) compliance for the entire sub-watershed and preclude construction of other BMPs upstream. Important outcomes of this project as listed in the following table.

<u>Via Princessa/Site X Goals, Objectives and Performance Measures</u>

Goal	Objective	Performance Measure
Improve Water Quality	Reduce water pollution and protect beneficial uses	Reduce e. Coli, copper, and zinc levels by infiltration of up to 32.9-acre feet to 35.9-acre feet of stormwater and urban runoff per storm
Improve Water Quality	Remove trash	Trash 5 mm or larger removed from urban runoff
Enhance Water Supply	Increased Groundwater Infiltration	Utilization of facility for potable water storage from Santa Clarita Valley Water Agency during dry season – volume will vary depending on water year.
Community Investment - Park	Park, community center, trails and walkways	The project would develop new park space next door to an underserved community
Nature Based Solution	Wetland	Considering dry riverbed feature as one of the components of the project which will be evaluated.
Leverage Funds	Use funds to match other types of funding	City application for Technical Assistance Regional funds is being evaluated by the USCR WASC and Los Angeles County

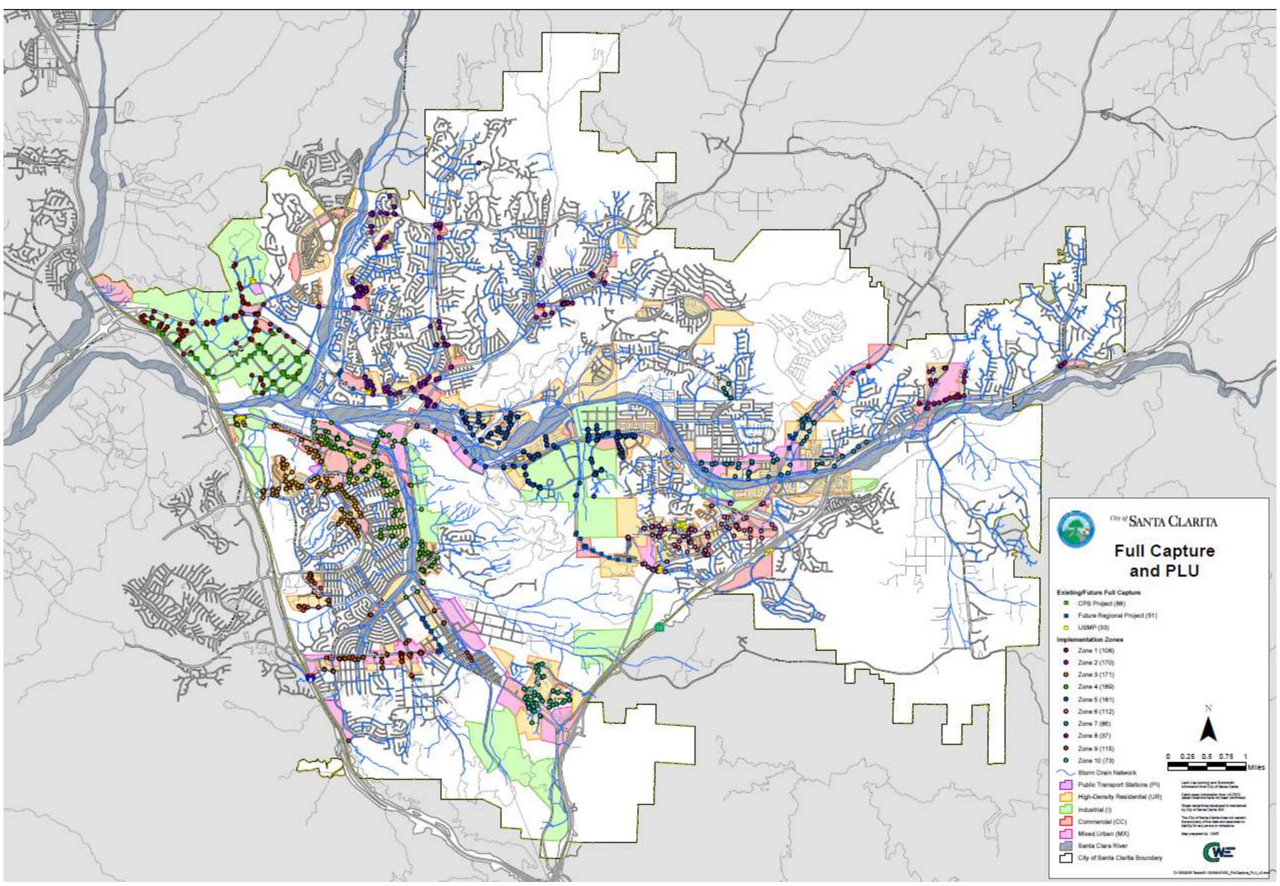
Via Princessa/Site X Site Map

Construction/Installation of Full Capture Devices for Trash Policy Compliance

In order to comply with the Statewide Trash Policy, the City will retrofit 1,242 storm drains over the next 8 years with full capture systems to prevent trash and particles that are 5 mm in diameter or greater from entering storm drains and ultimately reaching the Santa Clara River. The Trash Policy requires full capture devices in storm drains that collect runoff from specific land uses. This project will be the second year to install full capture devices in strategic locations. This fiscal year effort will install trash excluders in approximately 125 catch basins, or equivalent drainage area, improving water quality in the Santa Clara River. Important outcomes of this project as listed in the following table.

Full Capture Devices Goals, Objectives and Performance Measures

Goal	Objective	Performance Measure
Improve Water Quality	Remove trash	Up to 125 trash excluders or equivalent drainage area with other full capture devices will remove trash 5 mm or larger removed from urban runoff



Conceptual Design for up to Four Project from EWMP Update

The City of Santa Clarita, Los Angeles County, and Los Angeles County Flood Control District collaborate on compliance with the Los Angeles County NPDES Permit for stormwater through a Memorandum of Agreement. As part of that agreement and in compliance with the amended NPDES Permit, the group has hired a consultant to evaluate the existing Enhanced Watershed Management Plan (EWMP) and update the document. The City expects many changes to the BMPs prescribed for the EWMP. Once the final draft has been submitted, the City expects to review up to four of the highest priority projects from the updated EWMP for conceptual plan development. The details of the updated EWMP will be available by June 30, 2021. Specific performance measures will be developed at the time of conceptual design.

Goal	Objective	Performance Measures Foundation
Improve Water Quality	Reduce water pollution and protect beneficial uses	Priority pollutants outlined in EWMP
Improve Water Quality	Remove trash	Each project will be assessed in light of the trash policy requirements and full capture devices included where appropriate
Enhance Water Supply	Increased Groundwater Infiltration	Projects will be reviewed for alluvial aquifer recharge and potential for potable water storage
Community Investment - Enhance existing flood protection	Reduce parcels requiring flood insurance	Part of the evaluation will be to determine locations where flooding may be a concern to the local community and how the potential projects may help alleviate the concern
Community Investment - Park	Improve recreational opportunities	Where feasible, recreation facilities will be incorporated into plans
Community Investment - Park	Park, community center, trails and walkways	Where feasible, trails and walkways will be incorporated into plans
Nature Based Solution	Improve nature connectivity with the Santa Clara River	In conceptual designs, the work will include measures in now to incorporate nature-based solutions into potential projects
Leverage Funds	Use funds to match other types of funding	City will work to leverage City stormwater funds and Regional Safe Clean Water funds upon completion of the design.

A-2 Programs

A-2. Description of all programs anticipated to be funded using the SCW Program Payment. Include a discussion of how the programs will result in the achievement of one or more SCW Program Goals; including quantitative targets and corresponding metrics for subsequent reporting of all applicable parameters.

The City of Santa Clarita has a separate Stormwater Utility Fee that currently funds most of the ongoing programs for stormwater quality. For this period, the City of Santa Clarita does not anticipate using Municipal Safe Clean Water Measure W funds for programs.

A-3 Operation and Maintenance

A-3. Description of all operation and maintenance activities anticipated to be funded using the SCW Program Payment. Include a discussion of how those activities will result in the achievement of one or more SCW Program Goals. Additional operation and maintenance activities, even if funded by other sources, should be referenced to provide an overview of anticipated overall project approach.

The City of Santa Clarita will be using some of the funding this round towards operations. Part of the City staff salaries are being charged to Safe Clean Water Measure W funds. Darin Seegmiller, Heather Merenda, and Oliver Cramer are all Watershed Area Steering Committee members for the Upper Santa Clara River. They also have the responsibility for all administrative tasks surrounding Fund Transfer Agreements, reporting and tracking of the Safe Clean Water Measure W funds. The three are collaborating on the Via Princessa/Site X design process. Oliver Cramer is co-project manager for the full capture device projects. The operation costs by person and their achievement of Safe Clean Water Measure W program goals are summarized in the table below.

	Safe Clean Water Measure W Program Goals				
Operations Anticipated to be Funded v	Water Quality	Water Supply	Community Investment	Nature Based Solution	Leverage Funds
Partial Salary and Benefits – Darin Seegmiller	**O**	**O**	**O**		**O**
Partial Salary and Benefits – Heather Merenda	**O**	**O**	**O**	**O**	**O**
Partial Salary and Benefits – Oliver Cramer	**O**		**O**	**O**	

A-4 Stakeholder Engagement

A-4. Description of the stakeholder and community outreach/engagement activities anticipated to be funded with the SCW Program Payment, including discussion of how local NGOs or CBOs will be involved, if applicable, and if not, why. Additional outreach/engagement activities, even if funded by other sources, should be referenced to provide an overview of anticipated overall project approach.

This section responds to the Stakeholder and Community Outreach/Engagement Plan for Infrastructure Program Projects. The projects will have a long-term design process prior to construction and will include a Public Participation Plan. In 2020, the City of Santa Clarita updated the Public Participation Plan policy to assure adequate public participation for residents of Santa Clarita in project programs and issues of importance. It states that every major project is provided an opportunity for two-way communication between residents, local organizations and the City and the City Council, and to assure that the City Council has adequate public input on projects and items before them. As design decisions will significantly affect groups and neighborhoods surrounding projects like Via Princessa Park/Site X, the City will prepare a public participation plan for review of the City Manager that will address the following.

- Provide improved quality of life decisions and provide consensus building.
- Avoid worst case confrontations, maintain credibility and legitimacy by following a decision-making process which is visible and credit with the public.
- Provide information that than rational and allow sufficient time for citizen participation.
- The plan must provide for adequate two-way communications between the City and the public using a variety of communications techniques with a wide variety of audiences within the City.
- The proposed plan will include
    - A statement of what the project and the plan addresses
    - Background of the project
    - Major issues identified of the project
    - Perceived level of interest

This plan will be coordinated through the City of Santa Clarita Communication Division then to the City Manager for his approval. Once approved, the plan will be implemented along with the design work.

	Safe Clean Water Measure W Program Goals				
Stakeholder Anticipated to be Funded v	Water Quality	Water Supply	Community Investment	Nature Based Solution	Leverage Funds
Via Princessa/Site X Community Engagement	**O**	**O**	**O**	**O**	**O**

A-5 Post Construction Monitoring

A-5. Description of post-construction monitoring for projects completed using the SCW Program Payment. Additional post-construction monitoring activities, even if funded by other sources, should be referenced to provide an overview of anticipated overall project approach.

The City of Santa Clarita has a separate Stormwater Utility Fee that currently funds most of the ongoing programs for stormwater quality. Water quality monitoring is currently funded from the Stormwater Utility Fee. For this period, the City of Santa Clarita does not anticipate using Municipal Safe Clean Water Measure W funds for post construction monitoring.

A-6 Institute for Sustainable Infrastructure (ISI) verification

The City of Santa Clarita does not anticipate incorporating ISI verification for projects for this period. However, these elements will be considered in conceptual design.

A-7. Budget for the activities described in provisions A1 through A-5 are attached.

A-7. Provide the budget for the activities described in provisions A1 through A-5 SCW Program Payment.

	Expenditures
	FY 21-22
Technical Resources Program	
Feasibility Studies/Concepts	
Up to Four Projects Idenfied in EWMP Update (complete list by June 30, 2021)	$1,350,000
Project Post Feasibility Study	
Infrastructure Program	
Design/Permits/CEQA	
Via Princessa Park/Site X	$1,500,000
Right of Way Acquisitions Budget	
Construction	
Trash Excluders/Trash Policy Compliance	$230,000
O&M	
Administration of Measure W	
Salary	$100,741
Fringe Benefit/Overhead	$29,158
Non Project Activities	
Scientific Studies	
Special Studies	
Monitoring	
Total	$3,209,899

$4.5M Municipal Funding- Background Info

SAFE, CLEAN WATER MUNICIPAL REPORTING

Municipal Annual Plan

MUNICIPALITY	**Santa Clarita**
FISCAL YEAR (FY)	FY22-23
ANTICIPATED MUNICIPAL SCW EXPENDITURES FOR FY	$ 5,231,394.00

Submitted On: N/A

Created By: N/A (hmerenda@santa-clarita.com)

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ORGANIZATIONAL OVERVIEW:

1 ANNUAL PLAN OVERVIEW

2 PLANNED ACTIVITIES

1 ANNUAL PLAN OVERVIEW

Anticipated SCW Municipal Program Payments for the coming Fiscal Year:

$ 3,230,000.00

Estimated Rollover amount from the previous Fiscal Year's Municipal Program Payment:

$ 2,847,531.00

Total available funding:

$ 6,077,531.00

The following discussion provides an overview of the Activities under the Municipal Annual Plan for this Fiscal Year and general description of how the Activities will result in the achievement of one or more SCW Program Goals.

Protect the Santa Clara River from the trash and contaminants in stormwater through a regional stormwater project and installation of trash filters in storm drain

Help protect public health, ensuring safer, greener, healthier, and more livable spaces by creating a new park space on the east side of Santa Clarita that has inequitable park space.

Prepare our region for the effects of a changing climate and flooding through directing large storm to infiltration facilities, leaving more space for flood waters in the Santa Clara River.

Attachments for this Section	
Attachment Name	Description
None provided	N/A

2 PLANNED ACTIVITIES

The following table lists planned Activities and their details for the fiscal year.

Municipal Plan Activities			
Activity Name	New or Existing	Type	Annual Plan Amount
Design and permitting for installing trash filters	New	Project	$ 6,650.00
Install trash excluders	New	Project	$ 392,300.00
Operations Overhead	Existing	O&M	$ 35,960.00
Salaries	Existing	O&M	$ 144,484.00
Via Princessa Regional Infiltration Facility and Park Design	New	Project	$ 4,652,000.00

Municipal Activity Plan

ACTIVITY OVERVIEW (1 of 5)

ACTIVITY NAME	Design and permitting for installing trash filters
NEW OR EXISTING	New
ACTIVITY TYPE	Project
Annual Plan Amount	$ 6,650.00
Eligible Expenses	Yes

ACTIVITY ORGANIZATIONAL OVERVIEW:

Individual Activity Reports contain the following sections.

ACTIVITY DETAILS
ACTIVITY OTHER FUNDING
ACTIVITY SCHEDULE
ACTIVITY GOALS
ACTIVITY METRICS
ACTIVITY ADDITIONAL METRICS
PROJECT DETAILS
COMMUNITY BENEFITS
VECTOR MINIMIZATION
ISI STATUS

ACTIVITY DETAILS

The following table summarizes general information about this Activity.

Latitude, Longitude	N/A
Activity Description	Annual design and permitting for installing connector pipe screens and other full capture devices on up to 1,242 storm drains
Activity Background	Each year, the City will be required to make progress towards ultimately installing full capture devices on 1,242 storm drains by 2029, 621 before the year 2025. These storm drains are in land use areas regulated by the State Water Resources Control Board Trash Policy that was incorporated into the NPDES Permit that regulates stormwater quality in Los Angeles and Ventura counties. This line item funds the locating, permitting and bidding processes for making yearly progress on this requirement.
Description of anticipated Efforts	The City is required by the State to stop trash greater than 5 mm from entering the Santa Clara River from storm drains in high trash generating land uses. This project will deal with permitting connector pipe screens in storm drains.
Confirm Water Quality Related	Yes
Water Quality Benefits	Connector pipe screens are full capture devices that filter trash from the storm drain, preventing the trash from entering the Santa Clara River.
Total Project Cost	$ 12,193.00
Cost Share for Regional Project	No

The following table describes which watersheds, and to what degree, benefit from this activity.

Watershed Benefit Breakdown	
Watershed Name	Benefit Percent
Santa Clara River	100

ACTIVITY OTHER FUNDING

The following table provides a summary of expected additional expenditures using other funding sources.

Activity Other Funding		
Funding Type	Funding Description	Funding Amount
None provided	N/A	

ACTIVITY SCHEDULE

The following table outlines the tasks and schedule for this Activity.

Activity Schedule Table			
Task Name	Phase	Estimated Completion Date	Complete?
Permitting FY 22-23	Design	10/31/22	No
Permitting FY 23-24	Design	10/31/23	No
Permitting FY 24-25	Design	10/31/24	No
Permitting FY 21-22	Design	10/31/21	Yes

ACTIVITY GOALS

The following are the SCW goals this Activity intends to address.

A. Does this project improve water quality and contribute to attainment of water-quality requirements?

The Santa Clara River is required to comply with the State Water Resources Control Board trash policy. This project, when all phases are complete by 2028, will install connector pipe screens or full capture devices on 1,242 storm drains to prevent trash from entering the Santa Clara River.

ACTIVITY METRICS

The following metrics aim to quantify or describe how this Activity contributed to the SCW goals identified above.

Planned Activity Metrics Table
Metric Description
Annual volume of stormwater captured and treated. in ac-ft
Annual volume of stormwater captured and reused. in ac-ft
Annual volume of stormwater captured and recharged to a managed aquifer. in ac-ft

ACTIVITY ADDITIONAL METRICS

The following metrics are suggested metrics to record in this report.

Planned Activity Additional Metrics Table		
Metric Name	Description	Related Goals
Storm drains retrofitted	Number of storm drains that will have a 5 mm screen installed to prevent trash from entering the storm drain	water quality

PROJECT-SPECIFIC DETAILS

The following table provides a summary of Project benefits.

Project Weather Type	Wet
Project Capacity	N/A ac-ft
Area Managed	N/A ac
Annual Average Stormwater Capture	N/A ac-ft
Impervious Area Removed	N/A ac
Dry Weather Inflow	N/A ac-ft
Primary Pollutant	N/A
Primary Pollutant Reduction Amount	N/A%
Does this project implement or mimic natural processes?	No
Does this project utilize natural materials	No
Does this project include water reuse components?	No

Does this project include onsite use components?	No

PROJECT COMMUNITY BENEFITS

The following table outlines Community Benefits resulting from this Project.

Improves flood management, conveyance, and mitigation?	No
Creates, enhances, or restores park spaces, habitats, or wetland spaces?	No
Improves public access to waterways?	No
Creates or enhances new recreational opportunities?	No
Creates or enhances green spaces at school?	No
Reduces heat local island effect and increases shade?	No
Increases shade or the number of trees or other vegetation at the site location?	No

PROJECT VECTOR MINIMIZATION

The following table outlines the Project's vector minimization plan.

Does the project have a vector minimization plan?	No
Vector Minimization Plan Description	N/A
Consulted with local vector control district?	N/A

The following documents are Vector Minimization documents. They are attached after this activity's corresponding documents.

Attachments for this Section	
Attachment Name	Description
None provided	N/A

INSTITUTE FOR SUSTAINABLE INFRASTRUCTURE (ISI)

The following table outlines the Project's ISI certification status.

Is this project certified by the Institute for Sustainable Infrastructure?	N/A
ISI Project Status	N/A
Final Score	N/A
ISI Description	N/A
Award Level	N/A

Municipal Activity Plan

ACTIVITY OVERVIEW (2 of 5)

ACTIVITY NAME	Install trash excluders
NEW OR EXISTING	New
ACTIVITY TYPE	Project
Annual Plan Amount	$ 392,300.00
Eligible Expenses	Yes

ACTIVITY ORGANIZATIONAL OVERVIEW:

Individual Activity Reports contain the following sections.

ACTIVITY DETAILS
ACTIVITY OTHER FUNDING
ACTIVITY SCHEDULE
ACTIVITY GOALS
ACTIVITY METRICS
ACTIVITY ADDITIONAL METRICS
PROJECT DETAILS
COMMUNITY BENEFITS
VECTOR MINIMIZATION
ISI STATUS

ACTIVITY DETAILS

The following table summarizes general information about this Activity.

Latitude, Longitude	N/A
Activity Description	To meet the required trash policy, the City will install up to 1,242 trash excluders or other full capture devices in required storm drains
Activity Background	The City is required by the State to stop trash greater than 5 mm from entering the Santa Clara River from 1,242 storm drains in high trash generating land uses. The City needs to address 621 more before 2025, and the remaining 621 more before 2028. This requirement will be met through connector pipe screens and other full capture devices and green streets throughout the city.
Description of anticipated Efforts	The City is required by the State to stop trash greater than 5 mm from entering the Santa Clara River from 1,242 storm drains in high trash generating land uses before 2029. Previously, the City has installed an estimated 272 connector pipe screens in these storm drains. This is the annual effort to installed connector pipe screens. It is estimated at 150 connector pipe screens will be installed.
Confirm Water Quality Related	Yes
Water Quality Benefits	Connector pipe screens stop trash greater than 5 mm from entering the Santa Clara River from the storm drain system.
Total Project Cost	$ 1,500,000.00
Cost Share for Regional Project	No

The following table describes which watersheds, and to what degree, benefit from this activity.

Watershed Benefit Breakdown	
Watershed Name	Benefit Percent
Santa Clara River	100

ACTIVITY OTHER FUNDING

The following table provides a summary of expected additional expenditures using other funding sources.

Activity Other Funding		
Funding Type	Funding Description	Funding Amount
None provided	N/A	

ACTIVITY SCHEDULE

The following table outlines the tasks and schedule for this Activity.

Activity Schedule Table			
Task Name	Phase	Estimated Completion Date	Complete?
FY 21-22 Installation	Construction	12/31/21	Yes
FY 22-23 Installation	Construction	12/31/22	No
FY 23-24 Installation	Construction	12/31/23	No
FY 24-25 Installation	Construction	12/31/24	No

ACTIVITY GOALS

The following are the SCW goals this Activity intends to address.

A. Does this project improve water quality and contribute to attainment of water-quality requirements?

The City is required by the State to stop trash greater than 5 mm from entering the Santa Clara River from 1,242 storm drains in high trash generating land uses. This project will reduce trash entering the Santa Clara River.

ACTIVITY METRICS

The following metrics aim to quantify or describe how this Activity contributed to the SCW goals identified above.

Planned Activity Metrics Table
Metric Description
Annual volume of stormwater captured and treated. in ac-ft
Annual volume of stormwater captured and reused. in ac-ft
Annual volume of stormwater captured and recharged to a managed aquifer. in ac-ft

ACTIVITY ADDITIONAL METRICS

The following metrics are suggested metrics to record in this report.

Planned Activity Additional Metrics Table		
Metric Name	Description	Related Goals
Trash	the amount of trash removed from full capture devices during maintenance each year	water quality
Full capture devices installed	The number of full capture devices and storm drain from high priority land uses installed	water quality

PROJECT-SPECIFIC DETAILS

The following table provides a summary of Project benefits.

Project Weather Type	N/A
Project Capacity	N/A ac-ft
Area Managed	N/A ac
Annual Average Stormwater Capture	N/A ac-ft
Impervious Area Removed	N/A ac
Dry Weather Inflow	N/A ac-ft
Primary Pollutant	N/A
Primary Pollutant Reduction Amount	N/A%
Does this project implement or mimic natural processes?	No
Does this project utilize natural materials	No
Does this project include water reuse components?	No

Does this project include onsite use components?	No

PROJECT COMMUNITY BENEFITS

The following table outlines Community Benefits resulting from this Project.

Improves flood management, conveyance, and mitigation?	No
Creates, enhances, or restores park spaces, habitats, or wetland spaces?	No
Improves public access to waterways?	No
Creates or enhances new recreational opportunities?	No
Creates or enhances green spaces at school?	No
Reduces heat local island effect and increases shade?	No
Increases shade or the number of trees or other vegetation at the site location?	No

PROJECT VECTOR MINIMIZATION

The following table outlines the Project's vector minimization plan.

Does the project have a vector minimization plan?	No
Vector Minimization Plan Description	N/A
Consulted with local vector control district?	N/A

The following documents are Vector Minimization documents. They are attached after this activity's corresponding documents.

Attachments for this Section	
Attachment Name	Description
None provided	N/A

INSTITUTE FOR SUSTAINABLE INFRASTRUCTURE (ISI)

The following table outlines the Project's ISI certification status.

Is this project certified by the Institute for Sustainable Infrastructure?	N/A
ISI Project Status	N/A
Final Score	N/A
ISI Description	N/A
Award Level	N/A

Municipal Activity Plan

ACTIVITY OVERVIEW (3 of 5)

ACTIVITY NAME	Operations Overhead
NEW OR EXISTING	Existing
ACTIVITY TYPE	O&M
Annual Plan Amount	$ 35,960.00
Eligible Expenses	Yes

ACTIVITY ORGANIZATIONAL OVERVIEW:

Individual Activity Reports contain the following sections.

ACTIVITY DETAILS
ACTIVITY OTHER FUNDING
ACTIVITY SCHEDULE
ACTIVITY GOALS
ACTIVITY METRICS
ACTIVITY ADDITIONAL METRICS

ACTIVITY DETAILS

The following table summarizes general information about this Activity.

Latitude, Longitude	N/A
Activity Description	N/A
Activity Background	The City has costs for lighting, building maintenance, support staff and other expenses to administer these funds and support program staff. These overhead costs are a reimbursement to the General Fund.
Description of anticipated Efforts	In order for City staff to manage projects, implement programs, and install infrastructure consistent with Measure W and stormwater rules, there is overhead that is required. Staff require computers, a building and work space to work from, and many support efforts (i.e. purchasing for bids, City Clerk for City Council items, etc.) to complete the work needed. This item reimburses the general fund for those costs.
Confirm Water Quality Related	Yes
Water Quality Benefits	In order for staff to implement stormwater projects, there are many expenses that are needed to ensure staff can complete the work. Staff require computers, a building and work space to work from, and many support efforts (i.e. purchasing for bids, City Clerk for City Council items, etc.) to complete the work needed to reduce stormwater and urban runoff pollution.

The following table describes which watersheds, and to what degree, benefit from this activity.

Watershed Benefit Breakdown	
Watershed Name	Benefit Percent
Santa Clara River	100

ACTIVITY OTHER FUNDING

The following table provides a summary of expected additional expenditures using other funding sources.

Activity Other Funding		
Funding Type	Funding Description	Funding Amount
None provided	N/A	

ACTIVITY SCHEDULE

The following table outlines the tasks and schedule for this Activity.

Activity Schedule Table			
Task Name	Phase	Estimated Completion Date	Complete?
None provided	N/A	N/A	N/A

ACTIVITY GOALS

The following are the SCW goals this Activity intends to address.

N. Does this project ensure ongoing operations and maintenance for Projects?

The project and program work outlined in this spending plan require administrative and operational support to complete the work.

ACTIVITY METRICS

The following metrics aim to quantify or describe how this Activity contributed to the SCW goals identified above.

Planned Activity Metrics Table
Metric Description

ACTIVITY ADDITIONAL METRICS

The following metrics are suggested metrics to record in this report.

Planned Activity Additional Metrics Table		
Metric Name	Description	Related Goals
None Provided	N/A	N/A

Municipal Activity Plan

ACTIVITY OVERVIEW (4 of 5)

ACTIVITY NAME	Salaries
NEW OR EXISTING	Existing
ACTIVITY TYPE	O&M
Annual Plan Amount	$ 144,484.00
Eligible Expenses	Yes

ACTIVITY ORGANIZATIONAL OVERVIEW:

Individual Activity Reports contain the following sections.

ACTIVITY DETAILS
ACTIVITY OTHER FUNDING
ACTIVITY SCHEDULE
ACTIVITY GOALS
ACTIVITY METRICS
ACTIVITY ADDITIONAL METRICS

ACTIVITY DETAILS

The following table summarizes general information about this Activity.

Latitude, Longitude	N/A
Activity Description	Safe Clean Water funds offset partial staff salaries.
Activity Background	Safe Clean Water funds offset partial staff salaries. The staffs' salaries paid for with Safe Clean Water implement programs, projects, and performs reporting that improves water quality. There are also Capital Improvement Project managers who bill time for stormwater infrastructure projects. The work that supports Safe Clean Water program goals includes, but is not limited to, work on water quality monitoring requirements, reporting, public events such as 26th annual River Rally river clean up, developing projects to help treat stormwater, and providing training on various aspects of stormwater quality management.
Description of anticipated Efforts	This item partially funds three positions in the Environmental Services Division: Manager, Stormwater Compliance Administrator, and Project Development Coordinator. These three positions have the primary responsibility for compliance with the NPDES Permit and related TMDLs.
Confirm Water Quality Related	Yes
Water Quality Benefits	The Environmental Services Division staff are responsible for water quality monitoring, adaptive management, water quality education, and working on infrastructure projects that are the core program for increasing stormwater capture and reducing stormwater and urban runoff pollution.

The following table describes which watersheds, and to what degree, benefit from this activity.

Watershed Benefit Breakdown

Watershed Name	Benefit Percent
Santa Clara River	100

ACTIVITY OTHER FUNDING

The following table provides a summary of expected additional expenditures using other funding sources.

Activity Other Funding		
Funding Type	Funding Description	Funding Amount
None provided	N/A	

ACTIVITY SCHEDULE

The following table outlines the tasks and schedule for this Activity.

Activity Schedule Table			
Task Name	Phase	Estimated Completion Date	Complete?
None provided	N/A	N/A	N/A

ACTIVITY GOALS

The following are the SCW goals this Activity intends to address.

None Provided

ACTIVITY METRICS

The following metrics aim to quantify or describe how this Activity contributed to the SCW goals identified above.

Planned Activity Metrics Table
Metric Description

ACTIVITY ADDITIONAL METRICS

The following metrics are suggested metrics to record in this report.

Planned Activity Additional Metrics Table		
Metric Name	Description	Related Goals
Amount spent on salaries and benefits	Partial salaries and benefits of Environmental Services Division and Capital Improvement Division staff.	Improve water quality and contribute to attainment of water quality requirements.

Municipal Activity Plan

ACTIVITY OVERVIEW (5 of 5)

ACTIVITY NAME	Via Princessa Regional Infiltration Facility and Park Design
NEW OR EXISTING	New
ACTIVITY TYPE	Project
Annual Plan Amount	$ 4,652,000.00
Eligible Expenses	Yes

ACTIVITY ORGANIZATIONAL OVERVIEW:

Individual Activity Reports contain the following sections.

ACTIVITY DETAILS
ACTIVITY OTHER FUNDING
ACTIVITY SCHEDULE
ACTIVITY GOALS
ACTIVITY METRICS
ACTIVITY ADDITIONAL METRICS
PROJECT DETAILS
COMMUNITY BENEFITS
VECTOR MINIMIZATION
ISI STATUS

ACTIVITY DETAILS

The following table summarizes general information about this Activity.

Latitude, Longitude	34.409, -118.469
Activity Description	Concept, design, CEQA, permits and construction documents for Via Princessa Regional Infiltration Facility and Park
Activity Background	The Via Princessa Regional Infiltration Facility and Park will provide multiple benefits. Urban runoff from a nearby neighborhood and high traffic road will be directed into an underground detention facility, treated to remove pollutants, and then slowly percolated through naturally sandy soil. Through diverting and infiltrating up to 30.1 acre feet of stormwater per rain event, it will improve water quality in the Santa Clara River. Through collaboration with the Santa Clarita Valley Water Agency and their analysis, its shown the infiltration facility will recharge the alluvial aquifer. On top of the infiltration area, there will be a natural meadow and native plants that will improve the habitat value of the upland area. There will be a restored riparian area, with native plants and a lookout space to educate the public on riparian zones and native plants in the Santa Clara River. Adjacent to the infiltration facility and restored riparian area, there will be a new park that includes four multipurpose fields for organized sports and free play, community gathering areas, and playground areas. There will be children interaction areas that highlights the rustic nature of the area with drought tolerant and low impact landscaping features. A storm water drainage feature surrounding the park is designed to capture water runoff from the park and incorporated where appropriate in the the design.
Description of anticipated Efforts	The City is designing a regional infiltration facility and new park. The regional infiltration facility will have capacity to infiltration over 30 acre feet of stormwater and will divert dry weather flows. This line item is the design for the Via Princessa Park project. This expenditure will result in full permits and bidding documents for the project.

Confirm Water Quality Related	Yes
Water Quality Benefits	When constructed (which will be entered as a separate project for the Spending Plan) the project will include a vortex full capture device to remove trash and sediment, another sediment forebay, and a regional infiltration facility with capacity for 30.1 acre feet each rain event.
Total Project Cost	$ 6,000,000.00
Cost Share for Regional Project	No

The following table describes which watersheds, and to what degree, benefit from this activity.

Watershed Benefit Breakdown	
Watershed Name	Benefit Percent
Santa Clara River	100

ACTIVITY OTHER FUNDING

The following table provides a summary of expected additional expenditures using other funding sources.

Activity Other Funding		
Funding Type	Funding Description	Funding Amount
None provided	N/A	

ACTIVITY SCHEDULE

The following table outlines the tasks and schedule for this Activity.

Activity Schedule Table			
Task Name	Phase	Estimated Completion Date	Complete?
Conceptual Design	Planning (Pre-design)	06/30/22	No
Design Infiltration Area	Design	06/30/23	No
Design Riparian Restoration	Design	03/30/23	No
Design Active Park Area	Design	06/30/23	No
CEQA and Permits	Design	08/30/23	No
Bid Documents	Design	12/15/23	No

ACTIVITY GOALS

The following are the SCW goals this Activity intends to address.

A. Does this project improve water quality and contribute to attainment of water-quality requirements?

This project will address storm water quality issues in the area. The most prevalent pollutant is E. coli bacteria. One of the monitored storm drains upstream regularly exceeds E. coli requirements. Trash, sediment and various metals have also been found. By diverting this stormwater to the infiltration facility, the project will improve water quality requirements. It will also allow compliance with the trash policy, as the stormwater will pass through a vortex separator, which is a trash full capture device.

B. Does this project increase drought preparedness by capturing more Stormwater and/or Urban Runoff to store, clean, reuse, and/or recharge groundwater basins?

The City and the Santa Clarita Valley Water Agency (SCVWA) has collaborated on a project in this area. The SCVWA supports this project to keep more water in the alluvial aquifer in the valley and available for local supply.

C. Does this project improve public health by preventing and cleaning up contaminated water, increasing access to open space, providing additional recreational opportunities, and helping communities mitigate and adapt to the effects of climate change through activities such as increasing shade and green space?

This project will provide new active play areas and park space to the Canyon Country neighborhood. This area does not have equitable amounts of large park spaces as it was developed largely before City incorporation in 1987. Through this project, the City is balancing more direct access to parks in this underserved community. This project offers additional tree planting and shade sails to provide protection during hot weather.

D. Does this project leverage other funding sources to maximize SCW Program Goals?

The City is actively working on finding both grant funds and Regional SCW funds for this project.

E. Does this project invest in infrastructure that provides multiple benefits?

This infrastructure will provide stormwater treatment, groundwater recharge, active sports and play areas, and riparian/native habitat restoration.

F. Does this project prioritize Nature-Based Solutions?

The project will include riparian restoration and native plants.

J. Does this project provide DAC Benefits, including Regional Program infrastructure investments, that are not less than one hundred and ten percent (110%) of the ratio of the DAC population to the total population in each Watershed Area?

The two census tracts where the project will be built are disadvantaged communities. One tract has a Median Household Income of $42,474 with a population of 1,169 in 379 Households. The second tract has a population of 8,266 in 2,236 Households with a Median Household Income of $56,694.

N. Does this project ensure ongoing operations and maintenance for Projects?

The City of Santa Clarita has its own Stormwater Utility fee that is used to maintain stormwater infrastructure, implement adaptive management and other best management practices, provide inspections, and monitor water quality.

ACTIVITY METRICS

The following metrics aim to quantify or describe how this Activity contributed to the SCW goals identified above.

Planned Activity Metrics Table
Metric Description
Annual volume of stormwater captured and treated. in ac-ft
Annual volume of stormwater captured and reused. in ac-ft
Annual volume of stormwater captured and recharged to a managed aquifer. in ac-ft
Annual creation, enhancement, or restoration of Community Investment Benefits. If none, discuss considerations explored and reasons to not include. in acres
Annual acreage increases in Nature-Based Solutions and claimed level of NBS (with matrix demonstrating determination of good, better, best, as outlined in Exhibit C). If none, discuss considerations explored and reasons to not include. in acres
Annual eligible expenditures providing DAC Benefits. If none, discuss considerations explored and reasons to not include. in $

ACTIVITY ADDITIONAL METRICS

The following metrics are suggested metrics to record in this report.

Planned Activity Additional Metrics Table		
Metric Name	Description	Related Goals
Bid Documents	This is the design portion of the Via Princessa Project. The intent is to get documents, plans and specifications ready for a formal construction bidding process. There is a separate project for construction of Via Princessa with different metrics	Ultimately the project will improve water quality, water supply, community investments and nature based solutions. The construction project will include specific metrics for these elements.

PROJECT-SPECIFIC DETAILS

The following table provides a summary of Project benefits.

Project Weather Type	N/A
Project Capacity	30.1 ac-ft
Area Managed	997.8 ac
Annual Average Stormwater Capture	927.5 ac-ft
Impervious Area Removed	0 ac
Dry Weather Inflow	N/A ac-ft
Primary Pollutant	Bacteria
Primary Pollutant Reduction Amount	90%
Does this project implement or mimic natural processes?	Yes
Does this project utilize natural materials	Yes
Does this project include water reuse components?	No

Does this project include onsite use components?	No

PROJECT COMMUNITY BENEFITS

The following table outlines Community Benefits resulting from this Project.

Improves flood management, conveyance, and mitigation?	No
Creates, enhances, or restores park spaces, habitats, or wetland spaces?	Yes
Improves public access to waterways?	Yes
Creates or enhances new recreational opportunities?	Yes
Creates or enhances green spaces at school?	No
Reduces heat local island effect and increases shade?	Yes
Increases shade or the number of trees or other vegetation at the site location?	Yes

PROJECT VECTOR MINIMIZATION

The following table outlines the Project's vector minimization plan.

Does the project have a vector minimization plan?	No
Vector Minimization Plan Description	N/A
Consulted with local vector control district?	N/A

The following documents are Vector Minimization documents. They are attached after this activity's corresponding documents.

Attachments for this Section	
Attachment Name	Description
None provided	N/A

INSTITUTE FOR SUSTAINABLE INFRASTRUCTURE (ISI)

The following table outlines the Project's ISI certification status.

Is this project certified by the Institute for Sustainable Infrastructure?	N/A
ISI Project Status	N/A
Final Score	N/A
ISI Description	N/A
Award Level	N/A

ATTACHMENTS FOR SECTION:

Annual Plan Documents

ATTACHMENTS FOR SECTION 8.1:

ENVIRONMENTAL DOCUMENTS AND PERMITS

search our site..

Los Angeles County Storm Drain System

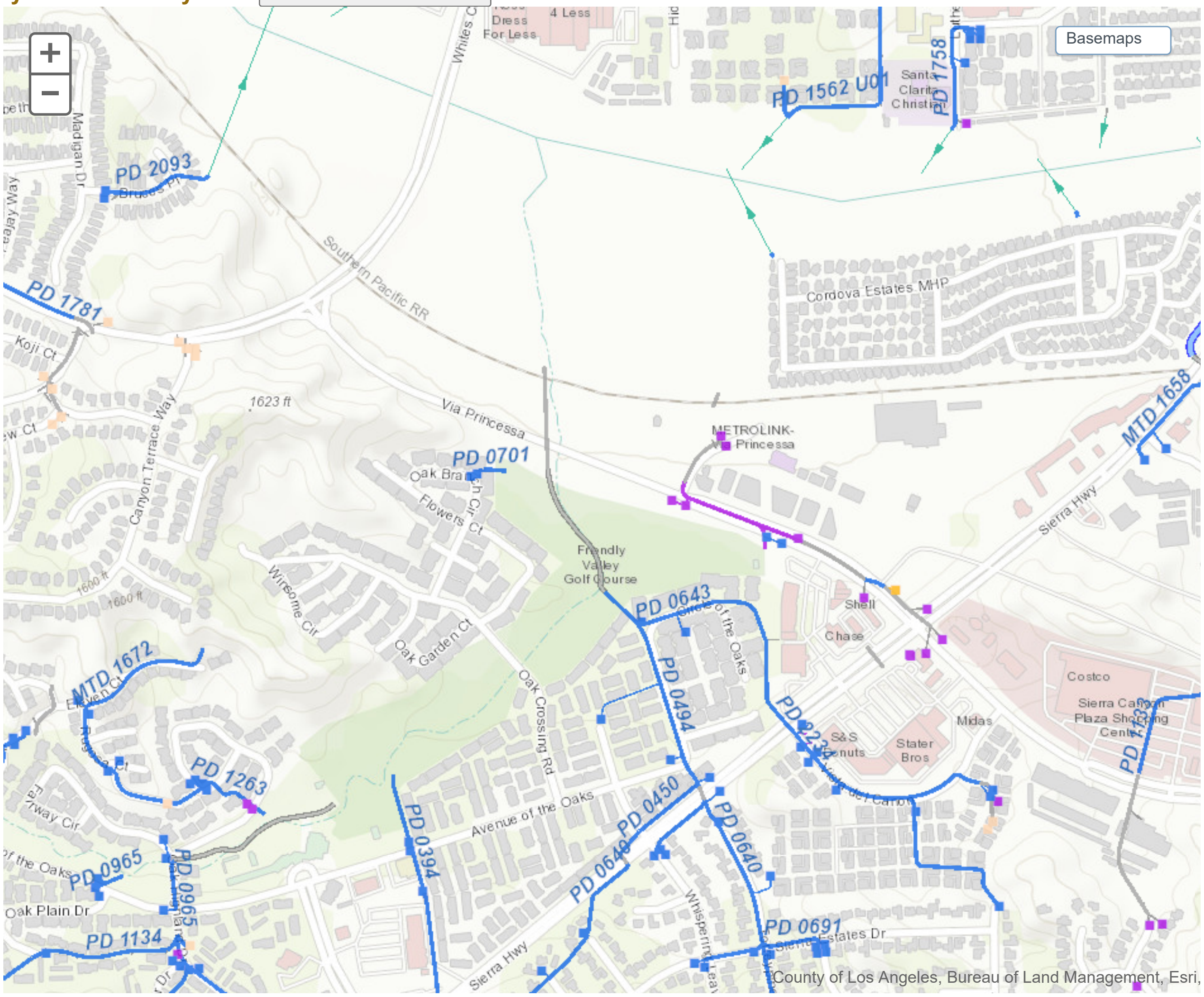
File Geodatabase Download

Search

Layers

Info

- [x] Drains
  - Maintained by LACFCD
  - Maintained by City
  - Maintained by Road
  - Maintained by Metro/Parks & Recreation
  - Maintained by Private/Permittee/Others
  - Maintained by Caltrans
  - Maintenance Unknown
- [x] Channels
  - Maintained by LACFCD
  - Maintained by City
  - Maintained by Caltrans
  - Maintenance Unknown
  - Maintained by Army Corp
- [x] Catch Basins
  - Maintained by LACFCD
  - Maintained by City
  - Maintained by Road
  - Maintained by Caltrans
  - Maintenance Unknown
  - Maintained by Others
- [ ] Maintenance Holes
  - Maintained by LACFCD



Map Tips

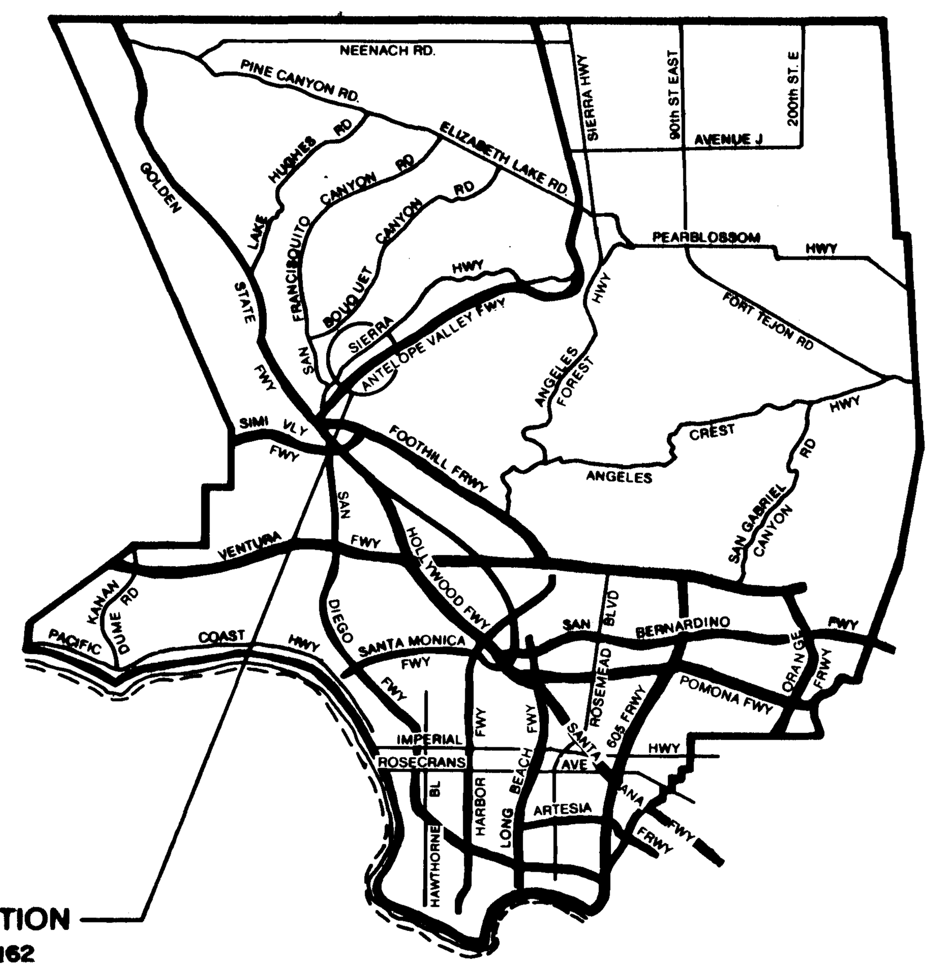
COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS

CASH CONTRACT NO. 1007

WHITES CANYON ROAD PHASE II

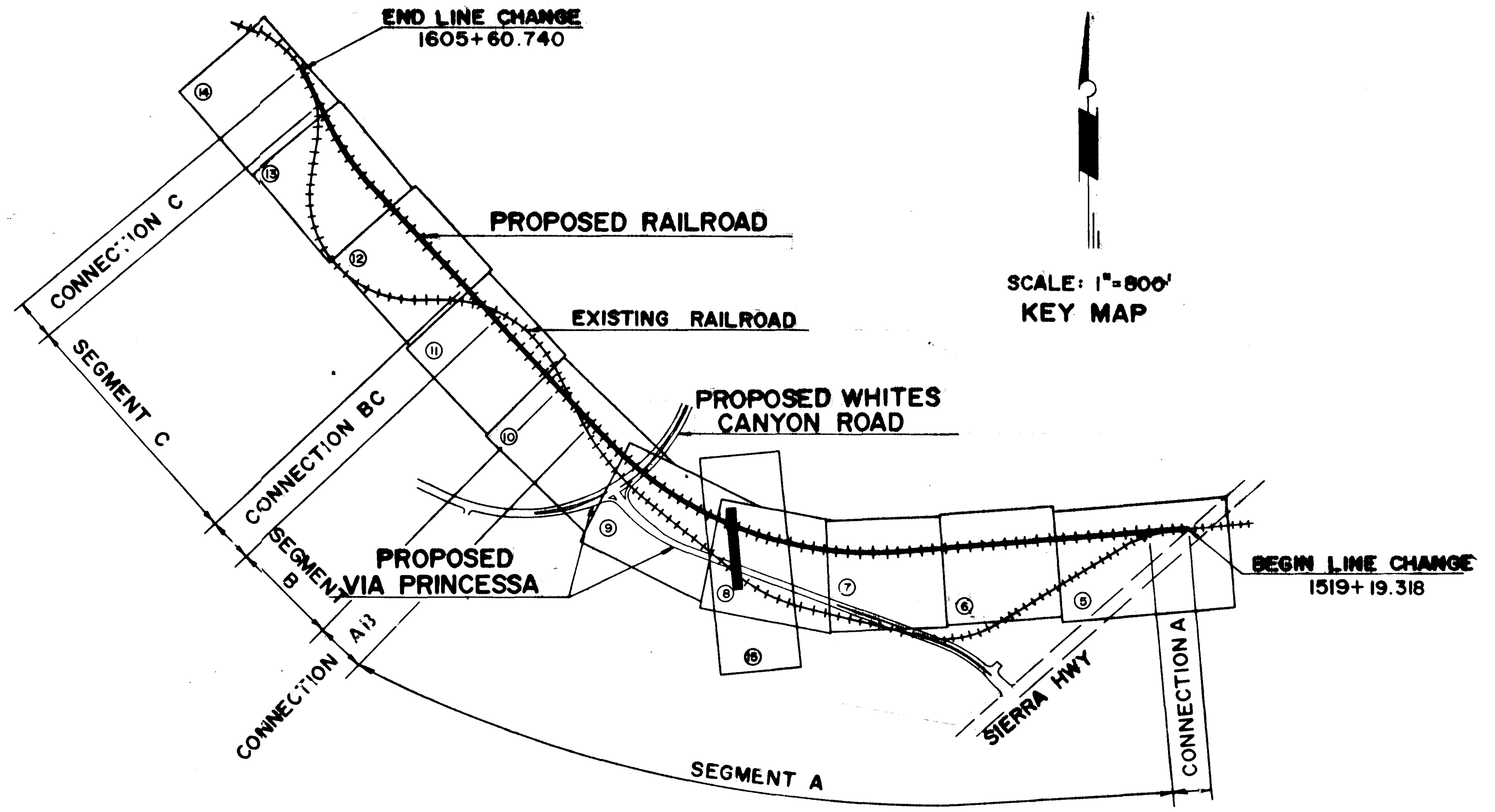
SOUTHERN PACIFIC TRANSPORTATION COMPANY
HONBY LINE CHANGE

TOTAL LENGTH 1.64 MILES



PROJECT LOCATION
R.D. 523 W.S. N62
T.G. 124, H-9

VICINITY MAP



SCALE: 1"=800'
KEY MAP

INDEX

CONSTRUCTION LEGEND

ITEMS UNDERLINED TO BE CONSTRUCTED

1. RAILROAD TRACK, INCLUDING 136 LB RAIL, BALLAST AND TIES.
2. CONCRETE BLOCK RETAINING WALL TYPE A (LACRD STD 48-03)
3. REINFORCED CONCRETE RETAINING WALL TYPE 6 (APWA STD 615-0)
4. ADJUST MANHOLE TO 2-1/2 FEET ABOVE FINISH SURFACE.
5. SUBBALLAST
6. SEWER ENCASEMENT.
7. REMOVE EXISTING RAILROAD TRACK, ~~BALLAST~~ AND TIES.
8. PCC GUTTER (APWD STD 617-0)
9. REINFORCED CONCRETE PIPE
10. HEADWALL (CALTRANS STD D89)
11. ENDWALL (CALTRANS STD D90)
12. PRECAST CONCRETE FLARED END SECTION (CALTRANS STD D94)
13. HEADWALL AND ~~WARPED~~ WINGWALLS (CALTRANS STD D90)
14. STONE RIP RAP, GROUTED
15. 5' CHAINLINK FENCE (APWA STD 600-0)
16. UTILITY ENCASEMENT (SPTC CS 1741)
17. SOUNDWALL.

CONVENTIONAL SYMBOLS FOR EXISTING TOPOGRAPHY

CURB
CURB & GUTTER
GUTTER
PAVEMENT: CONCRETE
ASPHALT
WALK
BARRICADE
BUILDING
DEAD MAN, GUY POLE
FENCE
FIRE HYDRANT
MANHOLE
PIPE
POLE
R. R. XING POST
SIGN
SIGNAL: CONTROL BOX
FLASHING
TRAFFIC
LOOP
STREET LIGHT
TREES: PALM
OTHER
VALVE
WALLS: BRICK/BLOCK
CONCRETE
STONE
WELL OR VAULT
WHEELCHAIR RAMP
GUARDRAIL
RAILROAD

GENERAL CONSTRUCTION NOTES:

1. FOR EXPLANATION OF RAILROAD SEGMENTS AND CONNECTIONS, SEE SPECIAL PROVISIONS
2. ALL R.C. PIPE SHALL BE A.S.T.M. C-76, CLASS IV.

DRAINAGE MAINTENANCE NOTES:

1. DRAINAGE FACILITIES SHOWN ON SHEETS 6-14 & 18-20 TO BE MAINTAINED BY SPTC
2. DRAINAGE FACILITIES SHOWN ON SHEETS 15-17 TO BE MAINTAINED BY FLOOD MAINTENANCE DIVISION

AS BUILT
Date 3/9/92 By EU

REGISTERED PROFESSIONAL ENGINEER
WILLIAM EDWARD BENNETT, JR.
No. 31452
Exp. 12-31-92
CIVIL
STATE OF CALIFORNIA

REFERENCES
PW F.B. 26-4
PW L.B.

CHECKER CONSULTANT
DESIGNER CONSULTANT
C.E. No. 41197
PROJECT ENGINEER

PRIME CONTRACTOR LICENSE REQUIRED: CLASS A

ASL Consulting Engineers
☐ ARCADIA
■ SANTA ANA (714) 250-5
☐ PALM SPRINGS
☐ RANCHO CUCAMONGA
☐ CAMARILLO

Wm E Bennett
WILLIAM E. BENNETT RCE 31452

DESIGNED BY J T / DRAWN BY T.S.	CHECKED BY TES / DATE DECEMBER 1989	SCALE AS SHOWN	JOB NO. 1247.068

PH089428

APPROVED Richard Kopecky 12-26-89
CITY OF SANTA CLARITA DATE

DATE	BY	DESCRIPTION
1/17/90	EU	Line Out 'Ballast', Add Item '16'
2/20/90	EU	Change Begin & End Stations

REVISIONS

APPROVED T.A TIDEMANSON DIRECTOR OF PUBLIC WORKS
By [signature] DEPUTY DIRECTOR 12/21/89 DATE
SUBMITTED [signature] DIVISION ENGINEER — DESIGN DIVISION 12/21/89 DATE
REVIEWED [signature] CONTRACTING SECTION 12/21/89 DATE

PROJECT NAME: WHITES CANYON ROAD PHASE II
PROJECT NUMBER: 1007
SHEET 1 OF 20 SHTS.
DWG. NO. #089428

4680 East Los Angeles Avenue, Suite O
Simi Valley, California 93063

Phase I Environmental Site Assessment
Site X
Santa Clarita, California

Prepared for:
Pacific Advanced Civil Engineering, Inc. (PACE)
1720 Newhope Street, Suite 200
Fountain Valley, California 92708

Prepared by:
JHA Environmental, Inc.
4680 East Los Angeles Avenue, Suite O
Simi Valley, California 93063

Stacie L. Aichner, P.G.
Senior Geologist/Project Manager

JHA Ref. No. F477
December 2018

EXECUTIVE SUMMARY

This report presents the results of a Phase I Environmental Site Assessment (ESA) performed by JHA Environmental, Inc. for Pacific Advanced Civil Engineering, Inc. (PACE) for the property designated by the City of Santa Clarita as "Site X", Santa Clarita, California (Site).

The objective of the Phase I ESA is to identify recognized environmental conditions, historical recognized environmental conditions, and controlled recognized environmental conditions at the Site in accordance with the scope of work contained in the American Society for Testing and Materials (ASTM) Designation E 1527-13 that constitutes the standard for All Appropriate Inquiry and in accordance with JHA's proposal dated May 16, 2018.

A government database report of available federal, state, and county agency databases was prepared by Environmental Data Resources (EDR) of Milford, Connecticut, and was reviewed by JHA to identify government regulated properties having known recognized environmental conditions and potential environmental concerns within the vicinity of the Site.

Based on the EDR database review, the Site is not identified in any of the environmental records databases searched for this report. The Site is not within 1.0 mile of a Federal Superfund property. Based on the information provided in the EDR database there is a low probability that the other listed properties have impacted the Site because of their regulatory status (case closed), their down- or cross-gradient locations and their distances from the Site.

Based on the historical aerial photographs, the Site was utilized for row crop agriculture between approximately 1900 and 1969. Chemicals such as pesticides, herbicides, and fertilizer would likely have been utilized during the Site's historical row crop agriculture use, although information regarding use, storage, and application rates was not available. Application of agricultural chemicals for their intended use is not considered to be a release; therefore, any residual would not be considered a REC. The Site has not been utilized for agricultural use since 1969.

Based on the aerial photographs the Site has remained vacant since at least 1969.

No environmental liens or other activity and use limitations (AULs) were found for the Site.

There are no listings for the Site in the County of Los Angeles Fire Department, Health Hazardous Materials Division active and inactive Certified Unified Program Agency (CUPA) program records or Site Mitigation Unit (SMU) case records.

There are no listings related to underground storage tanks, stormwater or industrial waste for the Site in the Los Angeles County Department of Public Works Underground Storage Tank (UST) Program records.

The Site reconnaissance revealed no evidence of RECs on the Site.

Since the relatively recent moving of the railroad immediately adjacent to the south of the Site and the approximate 25 foot easement on the north side of the track, it is unlikely that the railroad has had an environmental impact on the Site.

No recognized environmental conditions were observed on the adjacent properties from the Site boundaries or from the public right-of-way. No wetlands or wetland-type vegetation were observed at the Site.

Based on the information reviewed and summarized in this report, it is JHA's professional opinion that this assessment has revealed no evidence of RECs, as defined by the ASTM Designation E1527-13, at the Site.

Table of Contents

1.0 INTRODUCTION

This report provides the results of a Phase I Environmental Site Assessment (ESA) performed by JHA Environmental, Inc. (JHA) for the property designated by the City of Santa Clarita as "Site X", Santa Clarita, California (Site). The Site is comprised of approximately 23 acres and is bounded to the north by the intermittent west-northwest flowing Santa Clara River, to the east by a mobile home park, to the south by the Southern Pacific Railroad and to the west by the steeply embanked Whites Canyon Road (Figures 1 and 2). The Site has no physical address and is currently vacant land. Assessor Parcel Number (APN) is 2836-002-922.

The objective of the Phase I ESA is to identify recognized environmental conditions (RECs), historical recognized environmental conditions (HRECs), and controlled recognized environmental conditions (CRECs) at the Site in accordance with the scope of work contained in the *American Society for Testing and Materials (ASTM) Designation E 1527-13* that constitutes the standard for All Appropriate Inquiry (AAI). As defined in ASTM Designation E1527-13, RECs include "the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: (1) due to a release to the environment; (2) under conditions indicative of a release to the environment; or (3) under conditions that pose a material threat of a future release to the environment. *De minimis* conditions are not recognized environmental conditions". HRECs include "a past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting <u>unrestricted</u> use criteria established by a regulatory authority, without subjecting the property to any required controls". CRECs include "a recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority, with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls."

This ESA was performed in accordance with the scope of work provided in JHA's proposal and with the ASTM E 1527-13 scope of work for Phase I Environmental Site Assessments. In general, the assessment included a review of reasonably ascertainable current federal, state and county databases of known and potential environmentally impacted properties, a review of available city/county records, a review of available historical aerial photographs and historical maps, a review of an environmental lien search report, a Site reconnaissance to observe present conditions and an interview with a person familiar with the Site. Prior Site uses have been identified and are discussed in later sections of this report.

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional (EP) as defined in 40 CFR Part 312.10. I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the subject property. I have developed and performed the All Appropriate Inquiries in conformance with the standards and practices set forth in 40 CFR Part 312.

2.0 SITE DESCRIPTION

The Site is comprised of approximately 23 acres and is bounded to the north by the intermittent west-northwest flowing Santa Clara River, to the east by a mobile home park, to the south by the Southern Pacific Railroad and to the west by the steeply embanked Whites Canyon Road (Figures 1 and 2). The Site Assessor Parcel Number (APN) is 2836-002-922.

Historically, the Site has remained vacant since approximately 1969. A Quit Claim Deed was executed in 2016 transferring ownership of the Site from the County of Los Angeles to the City of Santa Clarita.

2.1 Physiographic Description

The Site is located in the southeast portion of Section 20, Township 4 North and Range 15 West, San Bernardino Baseline and Meridian (USGS, 1995; 7.5-Minute, Newhall, California Quadrangle). The elevation of the Site is approximately 1,382 feet above mean sea level (msl). The surface topography of the Site is generally flat, though the topography within the Site vicinity slopes gently to the west-northwest at a gradient of approximately 0.011 feet per foot. The Site lies within the Santa Clara River watershed. The Santa Clara River is immediately adjacent to the north of the Site.

2.2 Geology/Hydrogeology

The Site is located in the central portion of the Transverse Ranges geomorphic province of Southern California. Locally, the Site is situated on the north side of the Santa Clara River valley and is underlain by approximately 100 feet of Holocene alluvial deposits consisting of poorly sorted sands and gravels, and clay, with cobbles and boulders. Beneath the alluvium is approximately 100 feet of Pleistocene age terrace deposits consisting of crudely stratified, poorly consolidated, weakly cemented gravels, sands and silts. Beneath the terrace deposits is the late Pliocene age Saugus Formation consisting of approximately 8,500 feet of poorly-sorted and consolidated sandstones, siltstones and conglomerates. The San Gabriel Mountains flank the valley several miles to the northeast and the Santa Susana Mountains flank the valley to the southwest.

The Site is located in the East Sub-basin of the Santa Clara River Valley Groundwater Basin. There are two aquifer systems in the basin: 1) the alluvium generally underlying the Santa Clara River and tributaries, and 2) the Saugus Formation that underlies much of the entire Upper Santa Clara River area.

There is no municipal water supplied to the Site. There are no public supply water wells located within a one-mile radius of the Site according to the Environmental Data Resources (EDR) Radius Map Report (Appendix A). According to information obtained from the Los Angeles County Department of Public Works Hydrologic Records Section actively monitored groundwater wells located within a one-mile radius of the Site are as follows:

Well ID	Last Measure Date	Depth to Water (feet)	Groundwater Elevation (feet above msl)	Approximate Distance and Direction From Site (feet)
7139E	6/1/12	85	1,287	0
7139F	6/1/12	85	1,290	0
7139G	11/1/12	81	1,299	0
7148K	11/1/12	93	1,342	4,100 northeast

A review of the State Water Resources Control Board GeoTracker database shows no active clean-up site groundwater monitoring wells within one-mile of the Site. Based on general topography and relation to the Santa Clarita River it is estimated that the groundwater flow direction is to the west-northwest.

Surficial soils at the Site, according to the EDR Radius Map Report (Appendix A), are identified as Hydrologic Class B – Moderate infiltration rates. Soils are moderately well-drained coarse textures with the soil component name Cortina with sandy loam texture, at the Site.

The majority of the Site is located within a 100-year flood zone and the southeast portion of the Site is located within a 500-year flood zone according to the EDR Radius Map Report (Appendix A).

3.0 INVESTIGATION METHODOLOGY AND FINDINGS

JHA reviewed available reports, maps, photographs, databases, and permits regarding the history and development of the Site, and performed a reconnaissance of the Site and Site vicinity.

3.1 Federal and State Database Review

A government database report of available federal, state, and county agency databases was prepared by EDR of Milford, Connecticut, and was reviewed to identify government-regulated properties having known recognized environmental conditions and potential environmental concerns within the vicinity of the Site. The radii of investigation for the Federal and State agency lists were selected in accordance with the ASTM Standards. The government databases reviewed are described in detail in the EDR report. Also included in the EDR report are maps illustrating the location of the Site relative to the listed properties.

The 2018 Office of the Assessor, County of Los Angeles, Property Tax Map of the Site provided by EDR (Appendix B) indicates the Site is included in the City of Santa Clarita, Block 2836, and is identified as APN 2836-002-922.

There are no building permit records for the Site according to the EDR Building Permit Report (Appendix C).

A summary of properties that could not be mapped by EDR, but were identified as being potentially within the Site vicinity (orphan properties), are also included in the EDR report.

Based on the database review and as shown below, the Site is not identified on any of the databases searched by EDR. The Site is not within one-mile of a Federal Superfund property.

The pertinent findings of the government database review are summarized in the following table:

Property	Address	Distance (mi)	Databases	Findings
Texaco/Equilon #61-1	18802 Via Princessa	0.247	UST	UST quantity not reported
Shell Service Station	18802 Via Princessa	0.259	LUST, FINDS, ECHO	LUST site, **case closed**
CAL Recycling	19318 Soledad Canyon Road	0.276	SWRCY	recycling center
Unocal #4257	26909 Sierra Highway	0.292	LUST, HIST CORTESE	LUST site, **case closed**
Carriage Trade Cleaners	19324 Soledad Canyon Road	0.325	RCRA-SQG, ENVIROSTOR, FINDS, ECHO, LOS ANGELES CO. HMS, LA CO. SITE MITAGATION	small quantity hazardous waste generator, site evaluation, abated date 7/16/07, no action since abatement
Texaco	27125 Sierra Highway	0.334	LUST, HIST CORTESE	LUST site, **case closed**
Sierra Recycling	27125 Sierra Highway	0.334	AST, SWRCY, HIST UST	permitted AST, recycling center, historic UST, associated with listing above
Texaco	27125 Sierra Highway	0.334	LUST	LUST site, **case closed**, associated with listing above
Chevron Station No. 94490	19266 Soledad Canyon Road	0.341	LUST, RCRA NonGen/NLR, FINDS, ECHO	LUST site, RCRA non-generator

Property	Address	Distance (mi)	Databases	Findings
Chevron #9-4490	19266 Soledad Canyon Road	0.341	HIST CORTESE	historic CORTESE, associated with listing above
94490	19266 Soledad Canyon Road	0.341	LUST, HIST UST	LUST site, **case closed**, associated with listing above
Exxon #7-7915	19301 Soledad Canyon Road	0.359	HIST CORTESE	historic CORTESE
Exxon #7-7915	19301 Soledad Canyon Road	0.359	LUST, SWEEPS UST	LUST site, **case closed**, associated with listing above
USA Gasoline Station	19443 Soledad Canyon Road	0.359	LUST	LUST site, **case closed**
USA Gasoline Station	19443 Soledad Canyon Road	0.359	HIST CORTESE	historic CORTESE, associated with listing above
Leon Thompson	19223 Soledad Canyon Road	0.359	LUST, HIST UST	LUST site, **case closed**
Texaco	18727 Soledad Canyon Road	0.473	HIST CORTESE	historic CORTESE
Texaco	18727 Soledad Canyon Road	0.473	LUST	LUST site, **case closed**, associated with listing above
Texaco Service Station	18727 Soledad Canyon Road	0.473	LUST	LUST site, associated with listing above
Soledad Cleaners	18344 1/2 Soledad Canyon Road	0.902	ENVIROSTOR, LA CO. SITE MITAGATION	site evaluation, abated date 2/23/05, no action since abatement

Notes:
UST – Active Underground Storage Tank (UST) Facilities
LUST – Leaking UST
FINDS – Facility Index System
ECHO – Enforcement & Compliance History Information
SWRCY – Recycler Database
HIST CORTESE - Historic Hazardous Waste & Substance Site List
RCRA-SQG – Resource Conservation and Recovery Act (RCRA) Small Quantity Generator
ENVIROSTOR – Department of Toxic Substances Control (DTSC) EnviroStor Database
LOS ANGELES CO. HMS – Los Angeles County Industrial Waste and Underground Storage Tank Sites
LA CO SITE MITIGATION – County of Los Angeles Site Mitigation List
AST – Aboveground Petroleum Storage Tank (AST) Facilities
HIST UST – Historic UST Facilities
RCRA NonGen/NLR – RCRA Non Generators/No Longer Regulated
SWEEPS UST - Statewide Environmental Evaluation and Planning System UST Listing

Two of the above listed properties are dry cleaner sites under evaluation by the Los Angeles County Fire Department, Site Mitigation Unit and the California Department of Toxic Substances Control (DTSC). Carriage Trade Cleaners is approximately three tenths of a mile north-northwest of the Site and Soledad Cleaners is approximately nine tenths of a mile east-northeast of the Site, both of which are on the north side (opposite side) of the Santa Clara River in relation to the Site. According to the EDR search, both sites have been abated and no regulatory action has been taken since July 2007 at the Carriage Trade Cleaners site and since February 2005 at the Soledad Cleaners site. While these properties are listed, they are not considered RECs due to the distance and cross-gradient of the anticipated regional direction of groundwater flow relative to the Site.

One of the above properties, in the above EDR search, is listed as a recycling center which is not under investigation for spills or leaks into the environment.

Of the properties listed in the above EDR search with historic or active underground storage tanks (USTs) all are either not listed as sites that are under investigation for spills or leaks into the environment; or if a leak occurred (LUST), the investigation is complete and the case is closed. A search completed within a one-mile radius of the Site on the SWRCB GeoTracker database indicated four additional LUST or cleanup program sites that were not listed in the EDR search. All of these additional sites are listed as investigation complete/case closed.

3.2 Oil and Gas Development

The California Department of Conservation Division of Oil, Gas, and Geothermal Resources Online Mapping System was reviewed to assess the presence of known active or abandoned oil and gas wells within the Site vicinity. Based on the review, the Site was not identified within the designated boundaries of any oil or gas field. There is an active oil and gas field approximately one half mile south of the Site. Eleven plugged and abandoned oil/gas well locations were identified within a one-mile radius of the Site.

3.3 Agency Records Review

JHA reviewed records provided by the City of Santa Clarita, the Los Angeles County Department of Public Works Underground Tanks Unit, and the Los Angeles County Fire Department Hazardous Materials Division for information concerning the Site.

3.3.1 City of Santa Clarita

JHA submitted a public records request for the APN associated with the Site which yielded no information.

3.3.2 County of Los Angeles Fire Department Health Hazardous Materials Division

There are no listings for the Site in the County of Los Angeles Fire Department, Health Hazardous Materials Division active and inactive Certified Unified Program Agency (CUPA) program records or Site Mitigation Unit (SMU) case records.

3.3.3 Los Angeles County Department of Public Works UST Program

There are no listings related to underground storage tanks, stormwater or industrial waste for the Site in the Los Angeles County Department of Public Works Underground Storage Tank (UST) Program records.

3.4 Sanborn Maps, Topographic Maps, and Aerial Photograph Review

The Sanborn Library, LLC collection was searched for the Site and fire insurance maps covering the target property were not found (Appendix D).

Copies of historical topographic maps for the years 1900, 1929/1932, 1940, 1942, 1945, 1947, 1960, 1974, 1988, 1994, 1995 and 2012 available through EDR, were reviewed by JHA for historical land use identification (Appendix E). Based on the review of available topographic maps, the historical development of the Site and vicinity was evaluated and is summarized below:

> The 1900 topographic map (Fernando and San Fernando, 15-minute Quadrangles, 1:62500) shows the Santa Clara River to the north, the Southern Pacific Railroad to the south and a road adjacent to the east boundary of the Site. There two structures are shown on the Site: one is in the southeastern portion of the Site along the road; and the other is located in the west-central portion of the Site. The surrounding Site vicinity is largely undeveloped.
>
> The 1929/1932 topographic map (Humphreys and Sylmar, 7.5-minute Quadrangles, 1:24000) shows a drainage flowing north to south across the Site in the western portion of the Site. The road that bounds the east portion of the Site is unimproved. No structures are

shown on the Site. There are more roads to the north and south of the Site, but the vicinity remains undeveloped.

The 1940 topographic map (San Fernando, 15-minute Quadrangle, 1:62500) shows very little change to the Site and Site vicinity. There are more structures present to the north and south of the Site.

The 1942 topographic map (Humphreys and Sylmar, 7.5-minute Quadrangles, 1:24000) shows no change to the Site and Site vicinity.

The 1945 and 1947 topographic maps (San Fernando, 15-minute Quadrangle, 1:62500) shows no change to the Site and Site vicinity.

The 1960 topographic map (Mint Canyon, 7.5-minute Quadrangle, 1:24000) shows no change to the Site and Site vicinity.

The 1974 topographic map (Mint Canyon, 7.5-minute Quadrangle, 1:24000) shows the mobile home park immediately adjacent to the east of the Site. There is new development to the north and south of the Site.

The 1988 and 1994 topographic maps (Mint Canyon, 7.5-minute Quadrangle, 1:24000) shows more development to the north, south and northwest. There is no longer an unimproved road to the east of the Site.

The 1995 topographic map (Mint Canyon, 7.5-minute Quadrangle, 1:24000) shows more development surrounding the Site. The Southern Pacific Railroad track has been moved to immediately adjacent to the southern portion of the Site. Whites Canyon Road now extends across the Santa Clara River and abuts the western tip of the Site.

The 2012 topographic map (Mint Canyon, 7.5-minute Quadrangle, 1:24000) shows less detail in general than the 1995 topographic map.

Copies of aerial photographs covering the Site for the years 1928, 1940, 1947, 1952, 1969, 1970, 1972, 1983, 1989, 1994, 2002, 2005, 2009, 2012 and 2016 available through EDR, were reviewed by JHA for historical land use identification (Appendix F). Based on the review of available aerial photographs, the historical development of the Site and vicinity was evaluated and is summarized below:

Note: Seasonal vegetation and photographs with poor resolution might hinder viewing individual Site features

The 1928 (USGS) aerial photograph (1”=500’) shows a building in the south-central portion of the Site surrounded by row crop agriculture (farm). The drainage and unimproved road as described above (1929/1932 topographic map) to the west of the farm and bounding the east portion of the Site, respectively. The Southern Pacific Railroad is to the south and the Santa Clara River is to the north of the Site. The land to the north, east and south of the Site has been graded for what appears to be farmland/row crow agriculture.

The 1940 (USDA) aerial photograph (1”=500’) shows that the south central and southwestern portions of the Site have been graded. The land surrounding the Site remains farmland/row crow agriculture.

The 1947 (USGS) and 1952 (USDA) aerial photographs (1”=500’) shows that the majority of the Site being utilized for row crop agriculture. The land surrounding the Site remains farmland/row crow agriculture.

The 1969 (USGS) aerial photograph (1”=500’) shows the mobile home park to the east of the Site under construction. New residential neighborhoods are now present across the Santa Clara River to the north. To the south beyond the Southern Pacific Railroad is the Friendly Valley Golf Course and new residential neighborhoods. The Site is now vacant land.

The 1970 (USGS), 1972 (USGS), and 1983 (USGS) aerial photographs (1”=500’) shows very little change to the Site and immediate Site vicinity. There is new commercial development to the north across the Santa Clara River.

The 1989 (USDA) aerial photograph (1”=500’) shows very little change to the Site and immediate Site vicinity. The Whites Canyon Road Bridge across the Santa Clara River is under construction.

The 1994 (USGS/DOQQ) aerial photograph (1”=500’) shows the Site as graded west of the drainage with the completion of the Whites Canyon Road Bridge that now abuts the western tip of the Site. East of the drainage remains vacant. The Southern Pacific Railroad track has been moved to immediately adjacent to the southern portion of the Site. To the south of the new track is the new Via Princessa Metrolink Station and parking lot.

The 2002 (USDA), 2005 (USDA/NAIP), 2009 (USDA/NAIP), 2012 (USDA/NAIP), and 2016 (USDA/NAIP) aerial photographs show the Site remains vacant land with very little change to the developed land surrounding the Site.

Based on the topographic maps, the Site was mostly undeveloped land from at least 1900. Based on the historic aerial photographs, the Site was utilized for farmland/row crop agriculture until at least 1969. As confirmed by the aerial photographs, the Site has remained vacant land since 1969.

In general, no unusual features, such as pits, excavations, or significant fills were observed on the topographic maps or the aerial photographs in the Site vicinity.

Based on the historical aerial photographs, the Site was utilized for row crop agriculture between approximately 1900 and 1969. Chemicals such as pesticides, herbicides, and fertilizer would likely have been utilized during the Site’s historical row crop agriculture use, although information regarding use, storage, and application rates was not available. Application of agricultural chemicals for their intended use is not considered to be a release; therefore, any residual would not be considered a REC. The Site has not been utilized for agricultural use since 1969.

3.5 City Directory Abstract

A City Directory abstract prepared by EDR (Appendix G) was reviewed for the Site. Since the Site has no physical address the Site was not listed in the City Directory abstract. The City directories show adjacent properties to include private residences, businesses and schools.

3.6 Environmental Lien Search Report

An Environmental Lien Search Report provided by EDR, was reviewed by JHA. The title for Site APN 2836-002-922 is vested in the City of Santa Clarita as received from the County of Los Angeles in a Quit Claim Deed executed on December 20, 2016 and recorded on April 27, 2017.

There are no environmental liens or Other Activity and Use Limitations (AULs) listed in the EDR report for the Site. A copy of the Environmental Lien Search Report is provided as Appendix H.

3.7 Site Reconnaissance

JHA performed a Site reconnaissance on July 13, 2018. The Site remains vacant as described in Section 3.4. Unattended low lying grass, shrubs and a few small trees cover the Site. The drainage swale extends north towards the Santa Clara River from a controlled diversion pipe immediately north of the railroad track in the south-central portion of the Site. There are no public utilities supplied to the Site. According to information obtained from the Los Angeles County Department of Public Works Hydrologic Records Section there are three groundwater wells (last monitored in 2012) located on Site (7139E, 7139F and 7139G), though the wells were not observed during the Site reconnaissance. Overall the Site was environmentally unremarkable. Photographs taken during the Site Reconnaissance showing the current Site and vicinity are provided in Appendix I.

3.8 Adjacent Property Reconnaissance

Adjacent properties in the immediate Site vicinity were observed by JHA for evidence of recognized environmental conditions. The intermittent west-northwest flowing Santa Clara River bounds the northern extent of the Site; immediately east of the Site is a mobile home park; the Southern Pacific Railroad bounds the southern portion of the Site; and the steeply embanked Whites Canyon Road bounds the western extent of the Site.

Since the relatively recent moving of the railroad immediately adjacent to the Site (after 1989 and prior to 1994) and the approximate 25 foot easement on the north side of the track, it is unlikely that the railroad has had an environmental impact on the Site.

Overall, no recognized environmental conditions were observed on the adjacent properties from the boundary of the Site or from the public right-of-way.

4.0 SUMMARY OF NON-ASTM ISSUES

4.1 Asbestos

The evaluation of asbestos containing materials (ACMs) in buildings is excluded from ASTM E1527-13, though the presence of ACMs can be of environmental concern if present. Since there are no man-made buildings at the Site, the presence of ACMs is unlikely.

4.2 Mold and Legionella Bacteria

The evaluation of mold and legionella in building materials is excluded from ASTM E1527-13, though the presence of mold and legionella can be of environmental concern if present. Since there are no man-made buildings at the Site, the presence of mold and legionella is unlikely.

4.3 Lead-Based Paint

The evaluation of lead-based paint (LBP) in building materials is excluded from ASTM E1527-13, though the presence of LBP can be of environmental concern if present. Since there are no man-made buildings at the Site, the presence of LBP is unlikely.

4.4 Lead in Drinking Water

There is no municipal water supplied to the Site, therefore there is no risk of lead in drinking water.

4.5 Radon

Radon is a colorless, tasteless, radioactive gas that has been linked to a possible increased risk of lung cancer. According to the EPA, exposure to 4.0 picoCuries per liter of air (pCi/L) of radon gas on a regular basis increases the risk of lung cancer. The EPA has recommended a maximum indoor residential radon exposure limit 4.0 pCi/L.

According to the U.S. EPA Map of Radon Zones and the EDR Radius Map Report GeoCheck Physical Setting Source Map Findings, the Site is located in Radon Zone 2, where median indoor radon concentrations are between 2.0 - 4.0 pCi/L. Based on the EPA map data, there are moderate levels of radon in the area. The only true way to determine the presence of radon is through non-destructive testing, which was not part of this Phase I ESA.

5.0 SUMMARY OF FINDINGS

The following is a summary of the findings of this Phase I ESA report:

- The Site is not within 1.0 mile of a Federal Superfund property.
- Based on the database review, there is a low probability that the other listed properties have impacted the Site because of their regulatory status (case closed), their down- or cross-gradient locations and/or their distances from the Site.
- Based on the historical aerial photographs, the Site was utilized for row crop agriculture between approximately 1900 and 1969. Chemicals such as pesticides, herbicides, and fertilizer would likely have been utilized during the Site's historical row crop agriculture use, although information regarding use, storage, and application rates was not available. Application of agricultural chemicals for their intended use is not considered to be a release; therefore, any residual would not be considered a REC. The Site has not been utilized for agricultural use since 1969.
- Based on the aerial photographs the Site has remained vacant since at least 1969.
- No environmental liens or other activity and use limitations (AULs) were found for the Site.
- There are no listings for the Site in the County of Los Angeles Fire Department, Health Hazardous Materials Division active and inactive Certified Unified Program Agency (CUPA) program records or Site Mitigation Unit (SMU) case records.
- There are no listings related to underground storage tanks, stormwater or industrial waste for the Site in the Los Angeles County Department of Public Works Underground Storage Tank (UST) Program records.
- The Site reconnaissance revealed no evidence of RECs on the Site.
- Since the relatively recent moving of the railroad, immediately adjacent to the south of the Site and the approximate 25 foot easement on the north side of the track, it is unlikely that the railroad has had an environmental impact on the Site.
- No recognized environmental conditions were observed on the adjacent properties from the Site boundaries or from the public right-of-way.
- No wetlands or wetland-type vegetation were observed at the Site.

Based on the information reviewed and summarized in this report, it is JHA's professional opinion that this assessment revealed no evidence of recognized environmental conditions, as defined, at the Site.

6.0 LIMITATIONS

This report has been prepared by JHA Environmental, Inc. (JHA) for Pacific Advanced Civil Engineering, Inc. (PACE) as a Phase I Environmental Site Assessment (ESA) for the property designated by the City of Santa Clarita as "Site X", Santa Clarita, California (Site).

Inferences with respect to potential subsurface contamination are based on a review of readily available government and historical records, and Site reconnaissance. The findings and interpretations in this report have been developed based on a review of existing information pertaining to the Site. It should be recognized that subsurface contamination can vary laterally and vertically below a given site.

The Curriculum Vitae of the Environmental Professional who prepared this report is provided in Appendix J.

FIGURES

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Figure 1-Site Vicinity Map

Figure 2-Site Map

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

MARK PESTRELLA, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: SWP-4

July 28, 2022

Ms. Heather Merenda
City of Santa Clarita
Environmental Services Division
23920 Valencia Boulevard.
Santa Clarita, CA 91355

Dear Ms. Merenda,

VIA PRINCESSA PARK AND REGIONAL BMP PROJECT
LETTER OF CONCEPTUAL APPROVAL FOR SAFE, CLEAN WATER PROGRAM CONSIDERATION OF INFRASTRUCTURE FUNDING

Los Angeles County Flood Control District has been engaged to review the following project and is hereby providing this letter of conceptual approval:

Via Princessa Park and Regional BMP Project
City of Santa Clarita
Santa Clara River

We understand the proposed project will divert stormwater flows from the Honby Channel, not owned or maintained by the District, to an infiltration facility located on City property. The Project will also extend the existing riverbank liner connecting to the District's existing bank liner along the south bank of the Santa Clara River. The City may also request use of the District's access road during construction.

The Project is not currently inconsistent with any District plans, policies, or goals. Conceptual approval for this Project does not indicate the District's consent to support or even permit the Project. If funding is ultimately allocated to the Project, it is required that the developer remain closely engaged with the District throughout each subsequent project phase and comply with any eventual applicable agreement and/or permit provisions. Please upload a copy of this letter in the Projects Module application when responding to the Regional Program Call for Projects.

Thank you for your interest in the Safe, Clean Water Program. Please be sure to continue to work with your District Watershed Manager from Los Angeles County Public Works, Julian Juarez. Mr. Juarez can be reached at (626) 458-7149 or jjuarez@pw.lacounty.gov. Ongoing collaboration is imperative. If the subject project is not funded within 2 years from the date of this letter, a new demonstration of conceptual approval will be required before the project can again be considered.

Very truly yours,

MARK PESTRELLA, PE
Chief Engineer
Los Angeles County Flood Control District

Carolina T Hernandez

CAROLINA T HERNANDEZ, PE
Assistant Deputy Director
Stormwater Planning Division

RJG:tr
P:\swppub\Secretarial\2022\Letters\SCW Concept Approval letter_NEWS_Via Princessa Park and Regional BMP Project.docx

ATTACHMENTS FOR SECTION 8.2:

VECTOR MINIMIZATION

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Via Princessa Park and Regional BMP Project

Vector Minimization Plan

April 2022

Prepared For:

City of Santa Clarita

Submitted To:

The Greater Los Angeles County Vector Control District
12545 Florence Ave.,
Santa Fe Springs, CA 90670

Prepared By:

Pacific Advanced Civil Engineering, Inc.
17520 Newhope Street, Suite 200
Fountain Valley, CA 92708

Contact Persons:
Duong (Young) Do, PE
Cherise Thompson, EIT

PACE JN B351

1 Introduction

Pacific Advanced Civil Engineering (PACE) is working with the City of Santa Clarita to develop a plan for an underground infiltration BMP system located at 19201 Via Princessa Rd. in the City of Santa Clarita. The site is an undeveloped piece of land directly adjacent to the Santa Clara River, bordering the Cordova Estates mobile home community and the Via Princessa Metrolink Station. The site is proposed to be developed into a park with sports field to the east of Honby Channel, which runs beneath Via Princessa Rd. before confluencing with the Santa Clara River. To the west of Honby Channel, an underground BMP system is proposed to be constructed, which will divert runoff from Honby Channel into the infiltration gallery, up to the 85th percentile storm event.

Figure 1: Conceptual Project Layout

The infiltration BMP system is designed to divert runoff up to the 85th percentile storm event from Honby Channel to a diversion pipeline. From the diversion structure, the captured runoff will undergo treatment in a hydrodynamic separator, designed to handle the peak flow rate of the 85th percentile storm event. After treatment, the water will then enter the infiltration gallery, made up of rows of parallel corrugated metal pipes (CMP) that are perforated to allow infiltration into the underlying porous rock media and, eventually, into the surrounding soil.

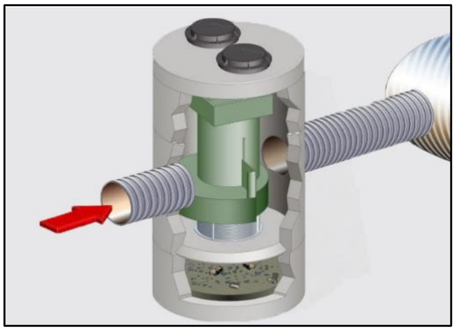

Figure 2: Hydrodynamic Separator Schematic

The purpose of the project is to remove pollutants from the urban runoff draining to the Santa Clara River, as well as augment the groundwater supply. The Santa Clara River is subject to TMDLs bacteria, nitrogen, chloride, copper, mercury, and cyanide. The proposed project will divert dry weather flows and wet weather flows, up to the 85th percentile storm event, treating this water and preventing the pollutants from reaching the River. The site is situated above the Eastern Santa Clara River Groundwater Basin.

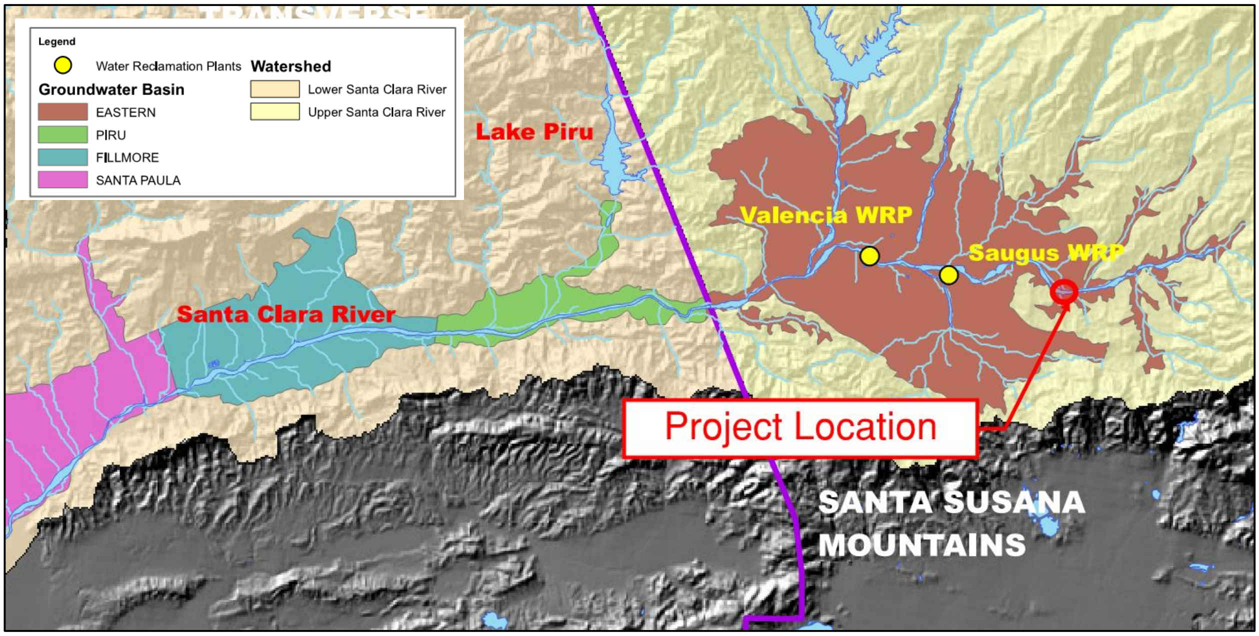

Figure 3: Santa Clara River Groundwater Basin Limits

A detailed geotechnical investigation has been performed by R.T. Frankian & Associates, demonstrating the site is feasible for infiltration, with an average weighted infiltration rate of 4.92 in/hr. The LA County minimum required infiltration rate for infiltration BMP facilities is 0.3 in/hr. The system is also designed to drain the captured 85th percentile storm in 41 hours, satisfying the LA County requirement of draining the facility in 96 hours or less.

2 Vector Minimization Plan

The following section presents the recommended strategies for the vector minimization plan, as laid out by the State of California Health and Human Services Agency and the California Department of Public Health, Division of Communicable Disease Control, and how the project plans to meet those recommendations. The recommendations presented are relevant to wet systems. Wet systems are defined as any structures designed with features such as sumps, vaults, and/or basins that hold water permanently, or longer than 4 days. Because the proposed BMP system is designed to capture dry weather flows, and wet weather flows up to the 85^{th} percentile storm event, it qualifies as a wet system.

2.1 Wet System Recommended Strategies

The following recommended strategies are laid out for wet systems:

1) Have sumps, vaults, or basins that hold water permanently, or longer than 4 days, been completely or partially sealed against adult mosquito entry?

   - The underground infiltration gallery will be completely below grade with the exception of manhole covers for access. The manhole covers are designed with mosquito exclusion inserts, eliminating any entry point for mosquitos.
   - The manhole covers for the hydrodynamic separators will utilize non-penetrating pick points, which will prevent mosquito access there as well.

2) If used, are covers tight fitting, with gaps or holes of no greater than 1/16” (2mm)?

   - Manhole covers will be tight fitting with no gaps or holes greater than 1/16” in size.

3) If used, are aluminum or nylon screens for sealing small openings secured with gaps or holes of no greater than 1/16 mesh (2mm)?

   - Screens are not needed.

4) If cast iron manhole covers are used, are pick holes sealed or is a mosquito-proof insert provided below?

   - Pick holes will not penetrate the hydrodynamic separator cover, eliminating access to mosquitos. Manhole covers over the infiltration gallery will include mosquito exclusion inserts.

5) Where feasible, are the inlet and/or outlet conveyance pipes submerged to prevent adult mosquito entry into the main water storage area?

   - The diversion at the Channel, which leads to the BMP inlet pipe, could be a possible entry point for mosquitos. During detailed design, screens will be evaluated for installation at the diversion structure drop inlet opening. However, it is also important that these screens not reduce the capacity of the diversion to convey the peak 85^{th} percentile storm flows.
   - No outlet pipes are part of the system

6) Where feasible, are conveyance pipes fitted with flapper valves, collapsible fabric tubes, or other barriers to prevent adult mosquito entry into the main water storage area?

   - The screen/mesh that will be evaluated at the drop inlet opening of the diversion in the Channel would eliminate the need for a flapper valve in the pipe, between the diversion and the hydrodynamic separator. Since the facility is designed to capture wet- and dry-weather flows, a flapper valve would be undesirable, since it would trap small flows upstream of the valve, preventing infiltration and creating a source of standing water.

7) Is the structure designed with safe and sufficient access to permanent water areas for inspection, maintenance, and/or vector control activities when needed?

- Manhole access points (with mosquito exclusion inserts) will be located along the header pipe of the infiltration gallery for frequent inspection and access. The underground CMP is proposed to be 8 ft. diameter, which is large enough for human entry.
- The hydrodynamic separator will also have a manhole cover (with non-penetrating pick points), allowing access for vector control inspection while excluding vectors. Vendors consulted for the project all carry current State Water Board certification and vector agency approval.
- The diversion pipe will be a reinforced concrete pipe (RCP) or PVC pipe, as opposed to CMP. CMP is undesirable for this system, as it traps small amounts of water in the corrugations.

8) Does the operation and maintenance plan include a minimum of quarterly inspections to ensure that barriers to mosquito entry are intact and in place as designed?

- Inspection for signs of mosquito activity will be performed at the same time as inspections for debris accumulation and system performance. As part of the operations and maintenance plan, the infiltration gallery, hydrodynamic separator, and diversion structure will all be inspected after each rain event during the first two years, and at least once per quarter.

9) Where possible, is signage provided with minimum information indicating type of structure (e.g. CDS™), ownership, and contact information?
   - Signage will be provided on the manhole covers for the hydrodynamic separator and the CMP infiltration gallery. Structure type is perforated CMP; ownership is by the City of Santa Clarita; contact information will be shown for the City of Santa Clarita's Public Works Department.

Cherise Thompson

From:	Heather Merenda <HMERENDA@santa-clarita.com>
Sent:	Wednesday, April 13, 2022 4:15 PM
To:	Leslie Frazier; Duong Do; Cherise Thompson
Cc:	Jeremy Johnson; Darin Seegmiller
Subject:	FW: City of Santa Clarita Safe Clean Water Measure W funding application

Good afternoon

We received the feedback from the Vector Control District. Some of these comments apply to the conceptual design, but many are really aimed at the actual design of the infiltration area.

These seems to be something that Dan, Jeremy and Leslie will need to coordinate later this year

Thanks
Heather

From: Mark Hall <mhall@glacvcd.org>
Sent: Wednesday, April 13, 2022 3:37 PM
To: Heather Merenda <HMERENDA@santa-clarita.com>
Cc: Susanne Kluh <skluh@glacvcd.org>; Heidi Heinrich <4heidishouse@gmail.com>
Subject: RE: City of Santa Clarita Safe Clean Water Measure W funding application

Hi, Heather

Your Vector Minimization Plan (VMP) submitted should satisfy the Safe Clean Water (SCW) feasibility requirement. You can incorporate the suggestions below to enhance the plan, but I usually don't see that level of detail submitted as part of the feasibility requirement. However, the District performs a separate review of stormwater projects that is not necessarily coupled to the SCW program. I have reviewed the VMP for the Via Princessa Park and Regional BMP Project submitted and will need additional information for that review. This VMP provides a basic description of the system but provides no detail. If detailed plans are not yet available, then let me add some clarification to some items referenced in the State Health Department's recommendations and point out additional items that should be considered and included in the project design and plan set.

2.1 Wet System Recommended Strategies:

1) Non penetrating pick point manhole covers – How does the infiltration gallery vent? Penetrating pick point manhole covers can be used if mosquito exclusion inserts are installed under the manhole covers. Also, all hydrodynamic separators utilize permanent water holding sumps or chambers and require sealed manhole covers or hatches, or the inclusion of mosquito exclusion inserts under manhole covers, as well.
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6) Where feasible, are conveyance pipes fitted with flapper valves… - This item can be difficult because current valving that is available may require more head pressure to open than what may be available during dry weather flows. This moves the water for mosquito breeding from the trash capture device or infiltration gallery into the conveyance pipe upstream of any valve. This is an item that would have to be closely looked at in the plan details prior to construction.
7) Is the structure designed with safe and sufficient access to permanent water areas for inspection… - Will the conveyance piping from the diversion through to the infiltration gallery also be CMP? CMP for infiltration is not an issue due to the perforations facilitating infiltration. However, CMP as conveyance piping is problematic due to the water held in the corrugations when there is no, or slight flow conditions. The hydrodynamic separator, or full trash capture device used must carry current State Water Board certification including the Mosquito and Vector Control Association of California endorsement. If proper exclusion measures are included in the system, mosquito inspections needed will be infrequent and possibly even unnecessary.

Again, what I have pointed out may not be necessary to get through Safe Clean Water Feasibility, but is required to comply with the District's project review process. Please do not forget to submit your designs to the District for review prior to securing permitting. This may seem like a lot or overkill, but it is very important to prevent the system from becoming a mosquito breeding source and potential health hazard. I will be happy to set up a meeting to provide more or better clarification for questions or concerns you may have or wish to discuss.

Thank you for your cooperation,
Mark

Mark Hall
Environmental Program Manager
Greater Los Angeles County Vector Control District
12545 Florence Avenue
Santa Fe Springs, CA 90670
562.244.2029 (Mobile)
562.944.9656 (Main)

From: Heidi Heinrich <4heidishouse@gmail.com>
Sent: Tuesday, April 12, 2022 8:54 AM
To: Mark Hall <mhall@glacvcd.org>
Cc: HMERENDA@santa-clarita.com; Susanne Kluh <skluh@glacvcd.org>
Subject: City of Santa Clarita Safe Clean Water Measure W funding application

EXTERNAL EMAIL

Good morning,

As Susanne had mentioned, the City of Santa Clarita is applying for Measure W funding. They are requesting assistance in reviewing their Vector Minimization Plan and provide any and all feedback that will assist in getting the highest score possible for Measure W eligibility.

Additionally, if there is a way for the District to endorse the plan, it would be greatly appreciated. I don't know if the endorsement should come from you or Susanne, but I'm sure Susanne would have the best information when it comes to that time.

The City is requesting the plan be reviewed and all feedback and suggested changes be completed by May 6, 2022 to provide ample time for the Measure W request to be submitted in early June 2022.

Heather Meranda is the lead for the City in this funding request. I have CC'd her on this email, and her contact information below.

Heather Merenda, MPA
LEED Professional, CPSWQ, QSP
Environmental Services Division
City of Santa Clarita
23920 Valencia Blvd.
Santa Clarita, CA 91355
Phone: (661) 284-1413
Mobile: (661)607-1904
Email: hmerenda@santa-clarita.com

I truly appreciate your time in this matter, and am happy to be of assistance as needed.

Sincerely,

Heidi Heinrich

Cherise Thompson

From:	Heather Merenda <HMERENDA@santa-clarita.com>
Sent:	Wednesday, May 4, 2022 1:49 PM
To:	Cherise Thompson
Subject:	FW: City of Santa Clarita Safe Clean Water Measure W funding application - Revised Plan

Good afternoon Cherise – we received approval from the Vector Control District

---

From: Mark Hall <mhall@glacvcd.org>
Sent: Friday, April 29, 2022 9:49 AM
To: Heather Merenda <HMERENDA@santa-clarita.com>
Cc: Susanne Kluh <skluh@glamosquito.org>; Heidi Heinrich <4heidishouse@gmail.com>
Subject: RE: City of Santa Clarita Safe Clean Water Measure W funding application - Revised Plan

Good morning, Heather

Thank you for the revisions addressing the District's concerns. Your Vector Minimization Plan is more than adequate to satisfy item #13 of the Safe Clean Water Feasibility Study.

The only concern in the revisions is with the potential screening at the creek diversion. Screening the diversion for mosquitoes will be too restrictive to facilitate the flow necessary for this system. This item can be removed if you like and addressed later in design. Valves or devices to exclude mosquito access in horizontal piping is still in development and must be looked at on a case by case basis and may not be feasible for this project.

Thanks again for your cooperation and I look forward to reviewing the detailed designs as you progress towards permitting.

Best,
Mark

Mark Hall
Environmental Program Manager
Greater Los Angeles County Vector Control District
12545 Florence Avenue
Santa Fe Springs, CA 90670
Office: 562.944.9656 x554
Cell: 562.244.2029

From: Heather Merenda <HMERENDA@santa-clarita.com>
Sent: Monday, April 25, 2022 4:02 PM
To: Mark Hall <mhall@glacvcd.org>
Cc: Susanne Kluh <skluh@glacvcd.org>; Heidi Heinrich <4heidishouse@gmail.com>
Subject: City of Santa Clarita Safe Clean Water Measure W funding application - Revised Plan

EXTERNAL EMAIL

Good afternoon Mr. Hall

Please find attached a revised Vector Minimization Plan that takes your comments into account. Would you be willing to review the attached plan with revisions? Most of the items have an answer now. However, some of the items will be considered as part of the procurement process and in the overall design which has yet to happen, as the project is just finishing conceptual design and will be moving to design and permitting shortly.

Thank you for your time

Heather Merenda, MPA
LEED Professional, CPSWQ, QSP
Environmental Services Division
City of Santa Clarita
23920 Valencia Blvd.
Santa Clarita, CA 91355

Phone: (661) 284-1413
Mobile: (661)607-1904
Email: hmerenda@santa-clarita.com
Web: www.greensantaclarita.com; www.santa-clarita.com

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Sent: Wednesday, April 13, 2022 3:37 PM
To: Heather Merenda <HMERENDA@santa-clarita.com>
Cc: Susanne Kluh <skluh@glacvcd.org>; Heidi Heinrich <4heidishouse@gmail.com>
Subject: RE: City of Santa Clarita Safe Clean Water Measure W funding application

CITY WARNING: This email was sent from an external server. Use caution clicking links or opening attachments.

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Mark Hall
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To: Mark Hall <mhall@glacvcd.org>
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Subject: City of Santa Clarita Safe Clean Water Measure W funding application

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Heather Meranda is the lead for the City in this funding request. I have CC'd her on this email, and her contact information below.

Heather Merenda, MPA
LEED Professional, CPSWQ, QSP
Environmental Services Division
City of Santa Clarita
23920 Valencia Blvd.
Santa Clarita, CA 91355
Phone: (661) 284-1413
Mobile: (661)607-1904
Email: hmerenda@santa-clarita.com

I truly appreciate your time in this matter, and am happy to be of assistance as needed.

Sincerely,

Heidi Heinrich

ATTACHMENTS FOR SECTION 8.6:

TECHNICAL REPORTS

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ATTACHMENTS FOR SECTION 8.7:

OTHER

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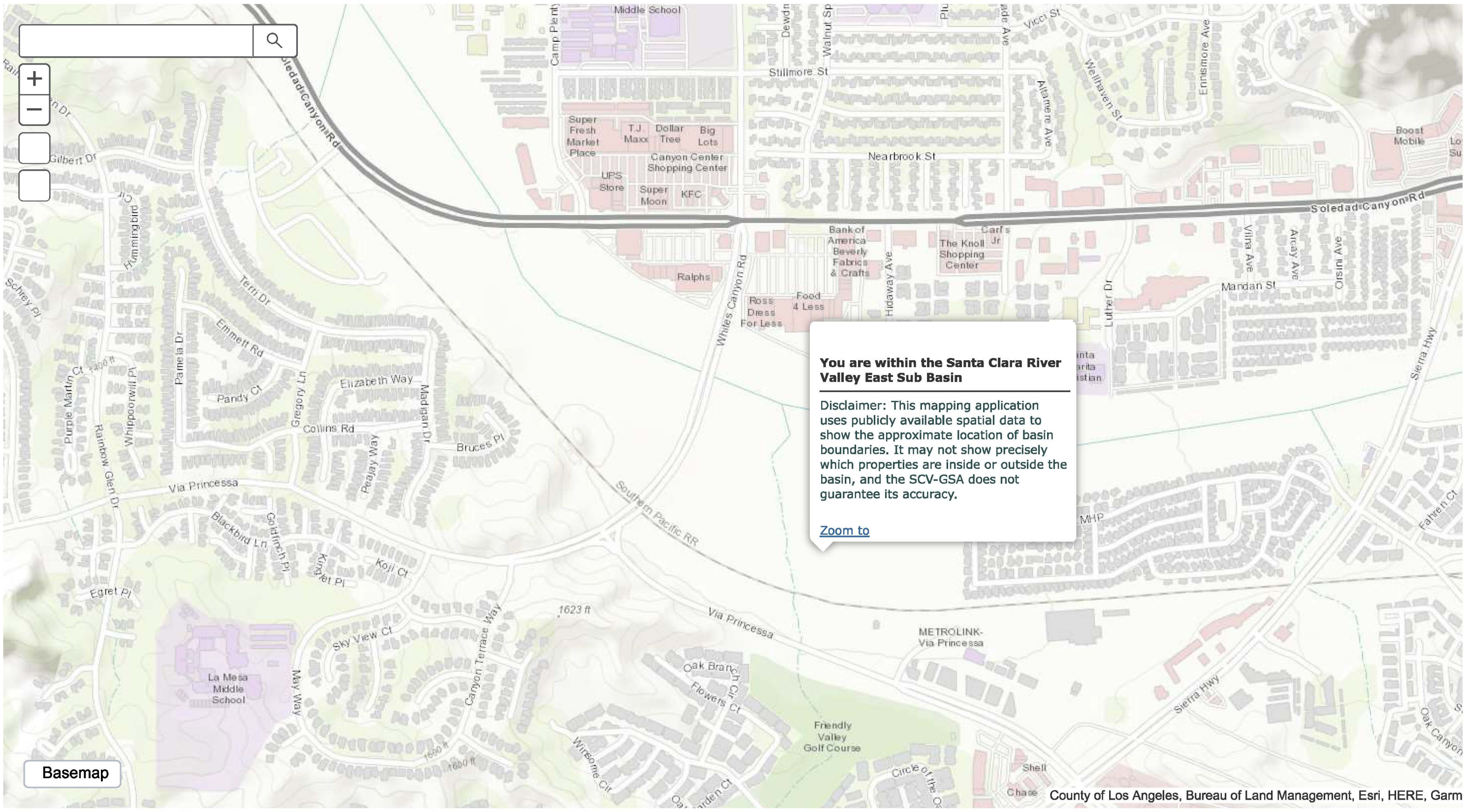
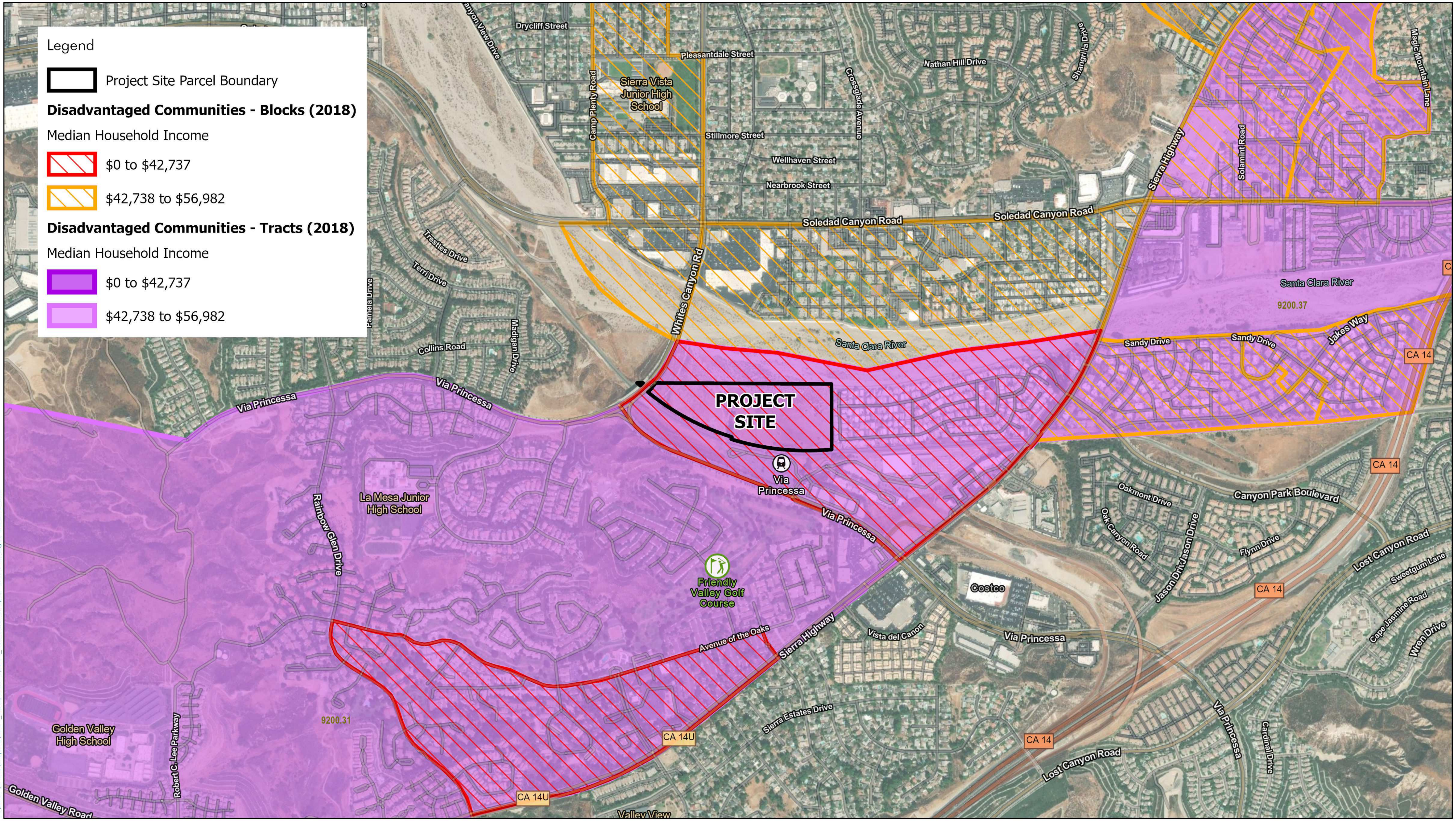
Santa Clara River Valley East Sub-Basin





Via Princessa Park & Regional BMP Project

DISADVANTAGED COMMUNITIES

PACE Advanced Water Engineering

0 500 1,000 2,000 Feet

Date: 10/26/2021

Job Number: B351

California State Parks

Community FactFinder Report

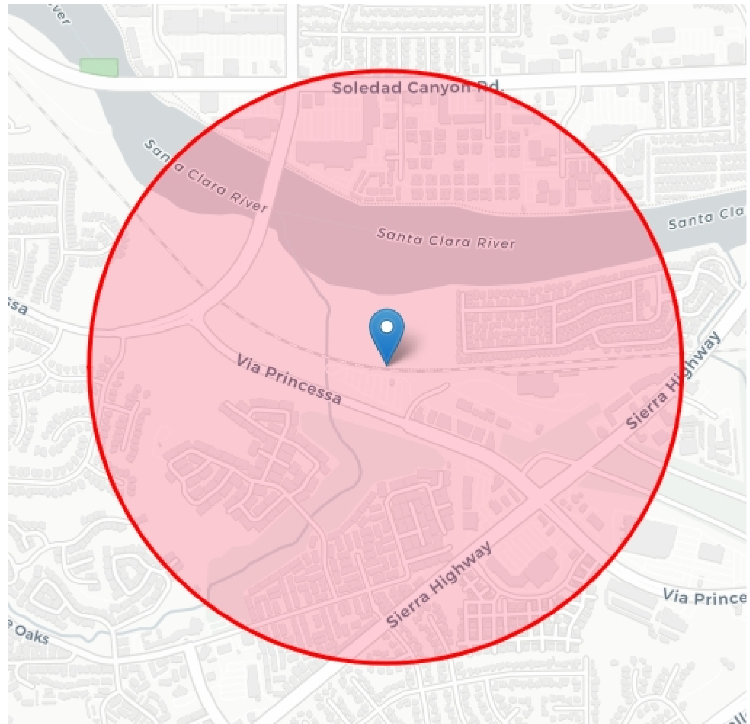
Project ID: 107960
Coordinates: 34.4088, -118.4694
Date: 6/8/2022

This is your project report for the site you have defined. Please refer to your **Project ID** above in any future communications about the project.

PROJECT AREA STATISTICS

County	Los Angeles
City	Santa Clarita
Total Population	4,136
Youth Population	843
Senior Population	745
Households Without Access to a Car	71
Number of People in Poverty	351
Median Household Income	$58,319
Per Capita Income	$32,646
Park Acres	0.00
Park Acres per 1,000 Residents	0.00

PROJECT AREA MAP



REPORT BACKGROUND

The project statistics have been calculated based on half mile radius around the point location selected. Only park acres within the project area's half mile radius are reported.

Population and people in poverty are calculated by determining the percent of any census block-groups that intersect with the project area. The project area is then assigned the sum of all the census block-group portions. An equal distribution in census block-groups is assumed. Rural areas are calculated at a census block level to improve results.

Median household and per capita income are calculated as a weighted average of the census block- group values that fall within the project area.

More information on the calculations is available on the methods page.

Demographics—American Community Survey (ACS) 5-year estimates 2014-2018; Decennial 2010 Census; the margin of error (MOE) was not analyzed.

Parks—California Protected Areas Database 2020a CFF adjusted (6/2020) - more information at http://www.CALands.org. Parks and park acres area based on best available source information but may not always contain exact boundaries or all parks in specific locations. Parks are defined further in the 2015 SCORP (pg. 4).

Users can send updated information on parks to SCORP@parks.ca.gov

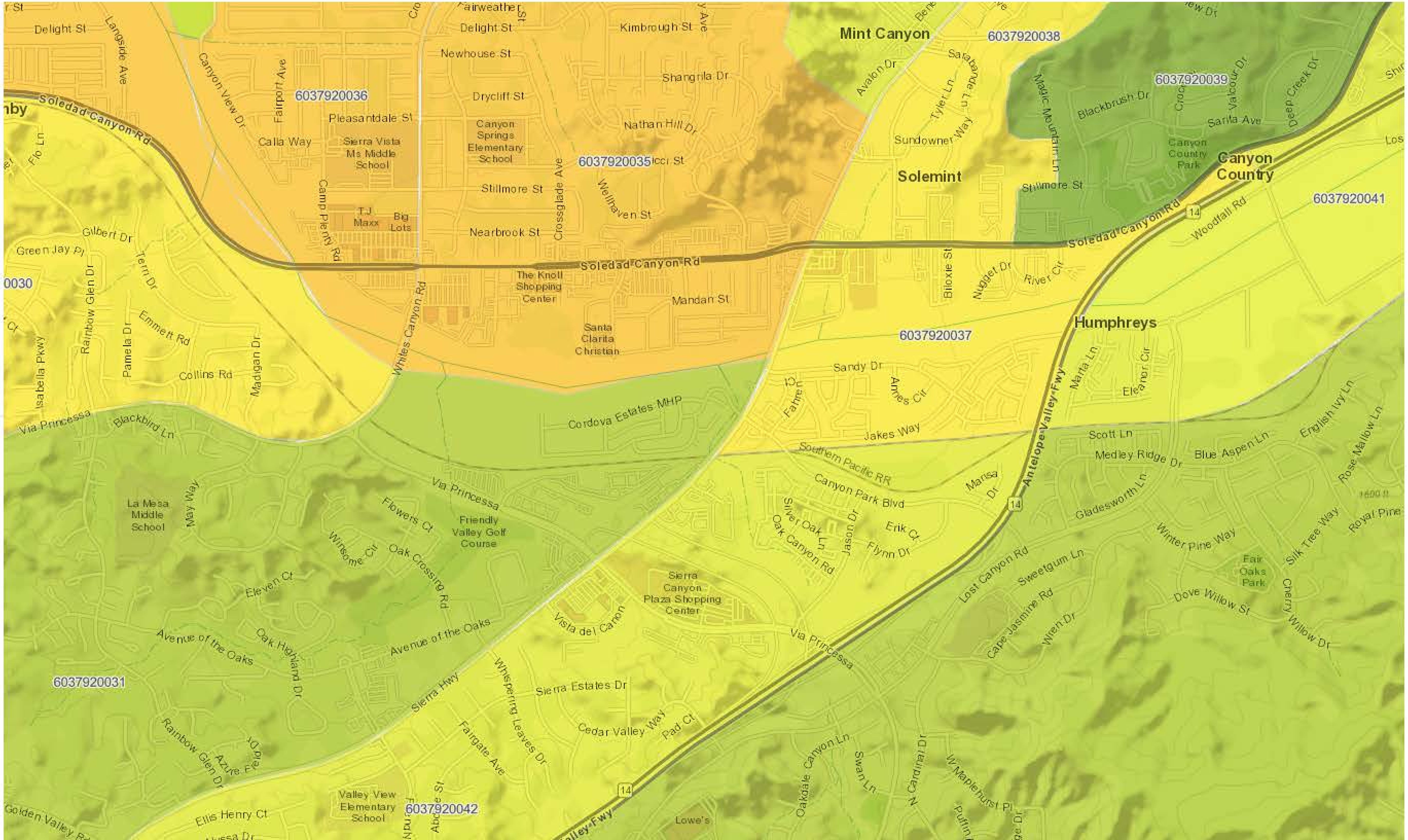
Via Princessa CalEnviroScreen 4.0 Score

Legend

CalEnviroScreen 4.0 Results

- > 90 - 100 (Highest Scores)
- > 80 - 90
- > 70 - 80
- > 60 - 70
- > 50 - 60
- > 40 - 50
- > 30 - 40
- > 20 - 30
- > 10 - 20
- 0 - 10 (Lowest Scores)

CalEnviroScreen 4.0 High Pollution, Low Population



we all need PARKS
for healthy, thriving and engaged LA communities

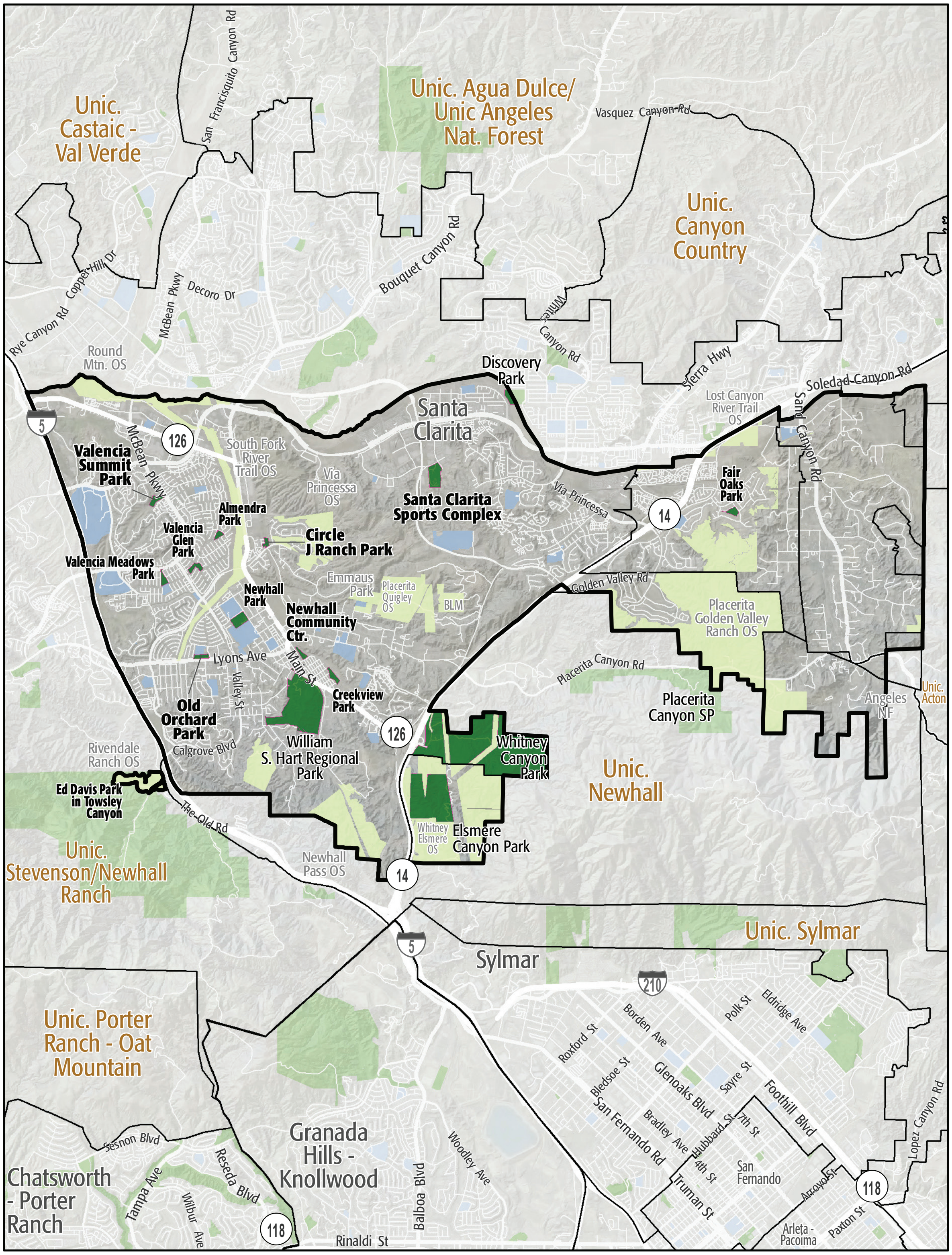
Santa Clarita - South

STUDY AREA PROFILE

STUDY AREA ID #151

- BASE MAP
- PARK METRICS
- WHERE ARE PARKS MOST NEEDED
- AMENITY QUANTITIES AND CONDITIONS
- PARK NEEDS FRAMEWORK
- PROJECT COST ESTIMATES
- PROJECT REPORTING FORM

STUDY AREA BASE MAP



Santa Clarita - South

Existing Park
Existing School
Existing Park Outside Study Area
Other Open Space

PARK METRICS

PARK LAND: Is there enough park land for the population?

442.5 PARK ACRES within study area | **92,622** POPULATION | **4.8** PARK ACRES PER 1,000

The county average is 3.3 park acres per 1,000

*This section does not include the 973.7 acres of regional open space, nature preserves, or State and National Forest land in this Study Area.

PARK ACCESSIBILITY: Is park land located where everyone can access it?

16% of population living WITHIN 1/2 MILE of a park

The county average is 49% of the population living within 1/2 mile of a park

PARK PRESSURE

How much park land is available to residents in the area around each park?

Almendra Park (4.34 Acres)
1.05 park acres per 1,000

Creekview Park (7.04 Acres)
1.18 park acres per 1,000

Fair Oaks Park (6.28 Acres)
1.23 park acres per 1,000

Newhall Park (14.28 Acres)
2.35 park acres per 1,000

Santa Clarita Sports Complex (24.85 Acres)
3.88 park acres per 1,000

Circle J Ranch Park (3.89 Acres)
1.91 park acres per 1,000

Ed Davis Park in Towsley Canyon (175.08 Acres)
54.39 park acres per 1,000

Newhall Community Center (4.88 Acres)
2.07 park acres per 1,000

Old Orchard Park (5.4 Acres)
0.66 park acres per 1,000

Valencia Glen Park (7.23 Acres)
2.99 park acres per 1,000

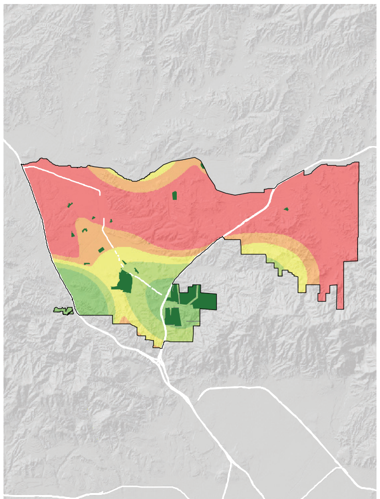
Valencia Meadows Park (6.07 Acres)
0.79 park acres per 1,000

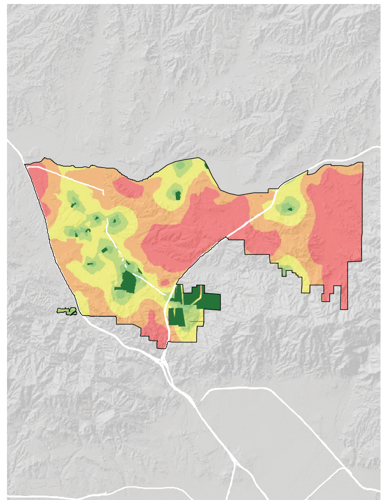
William S. Hart Regional Park (175.75 Acres)
34.93 park acres per 1,000

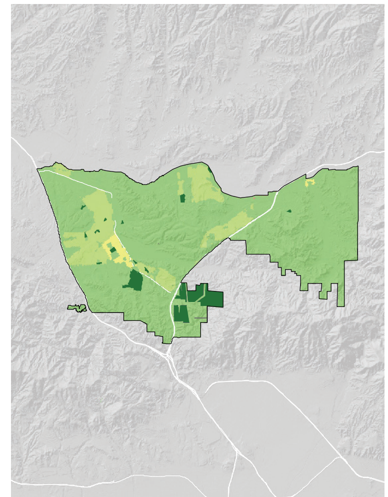
Valencia Summit Park (7.36 Acres)
0.83 park acres per 1,000

WHERE ARE PARKS MOST NEEDED?

PARK ACRE NEED + DISTANCE TO PARKS + POPULATION DENSITY

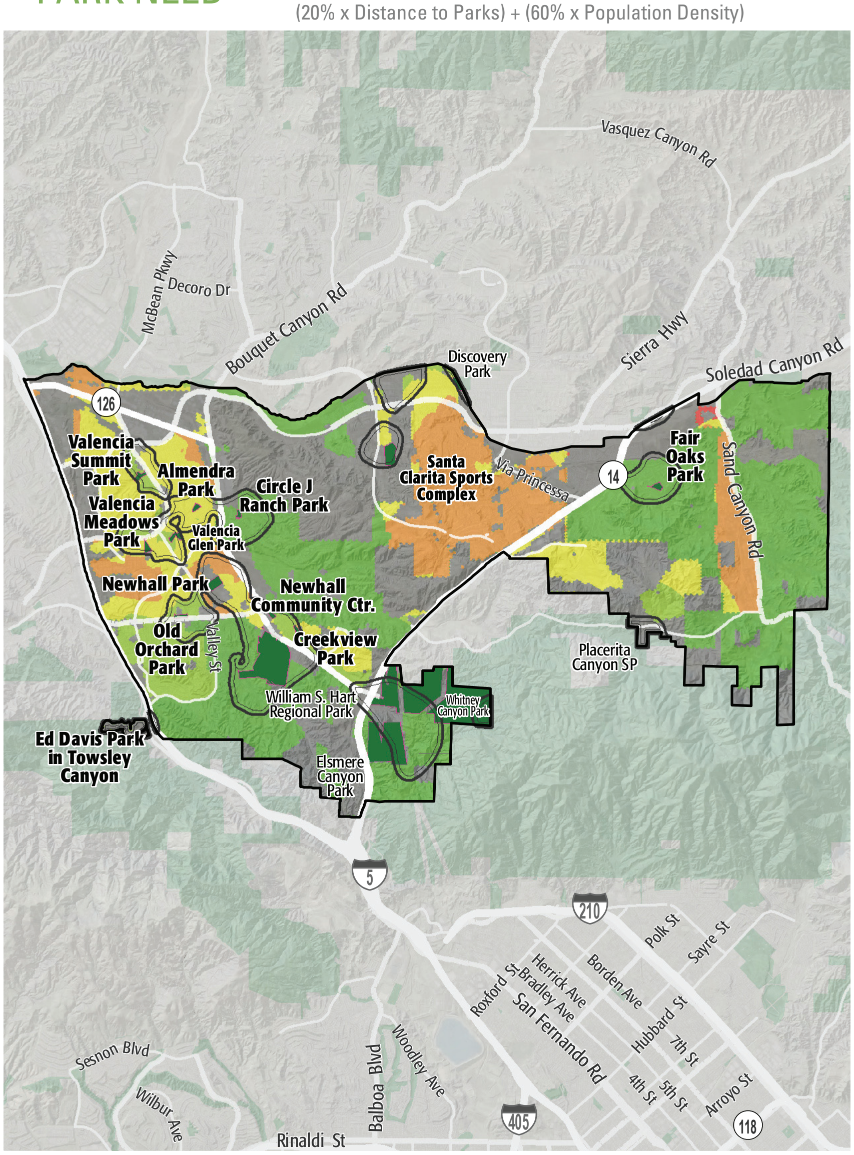






= PARK NEED

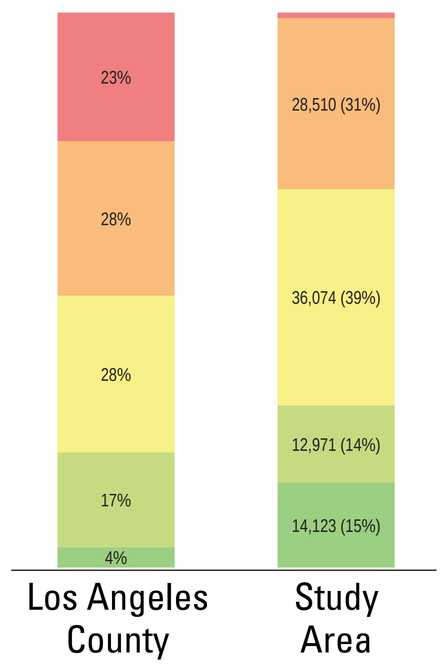
*Calculated using the following weighting: (20% x Park Acre Need) + (20% x Distance to Parks) + (60% x Population Density)



PARK NEED CATEGORY

- Very High
- High
- Moderate
- Low
- Very Low
- No Population
- Area within 1/2 mile walk of a park

HOW MANY PEOPLE NEED PARKS?



AMENITY QUANTITIES AND CONDITIONS

Park Name	Condition	General Infrastructure Condition	Open Lawn/ Turf Area	Tennis Courts	Basketball Courts	Baseball Fields	Soccer Fields	Mulitpurpose Fields	Fitness Zones	Skate Parks	Picnic Shelters	Playgrounds	Swimming Pools	Splash Pads	Dog Parks	Gymnasiums	Community/Rec Centers	Senior Centers	Restrooms	Total
				Amenities																
Almendra Park	Good																			0
	Fair				1							1								2
	Poor																			0
Circle J Ranch Park	Good																			0
	Fair										1	1							1	3
	Poor																			0
Creekview Park	Good																			0
	Fair				1							1							1	3
	Poor																			0
Ed Davis Park in Towsley Canyon	Good																			0
	Fair																		1	1
	Poor												1							1
Fair Oaks Park	Good																			0
	Fair				1						1	1							1	4
	Poor																			0
Newhall Community Center	Good																			0
	Fair				2							1					1			4
	Poor																			0

AMENITY CONDITIONS SUMMARY

Almendra Park

Circle J Ranch Park

Creekview Park

Ed Davis Park in Towsley Canyon

Fair Oaks Park

Newhall Community Center

AMENITY QUANTITIES AND CONDITIONS

Park Name	Condition	General Infrastructure Condition	Open Lawn/ Turf Area	Amenities																
				Tennis Courts	Basketball Courts	Baseball Fields	Soccer Fields	Mulitpurpose Fields	Fitness Zones	Skate Parks	Picnic Shelters	Playgrounds	Swimming Pools	Splash Pads	Dog Parks	Gymnasiums	Community/Rec Centers	Senior Centers	Restrooms	Total
Newhall Park	Good																			0
	Fair				2	1		1				1	1				1		2	9
	Poor																			0
Old Orchard Park	Good																			0
	Fair				1	1						1					1			4
	Poor							1											1	2
Santa Clarita Sports Complex	Good																			0
	Fair				2			1	1	1	1		3		1	1	1			12
	Poor																			0
Valencia Glen Park	Good																			0
	Fair			2				1				1	1				1		1	7
	Poor																			0
Valencia Meadows Park	Good																			0
	Fair				1	1		1				1	1				1		1	7
	Poor																			0
Valencia Summit Park	Good										1	1								2
	Fair			3																3
	Poor																			0

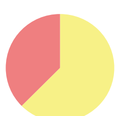
AMENITY CONDITIONS SUMMARY

Newhall Park | Old Orchard Park | Santa Clarita Sports Complex | Valencia Glen Park | Valencia Meadows Park | Valencia Summit Park

AMENITY QUANTITIES AND CONDITIONS

Park Name	Condition	General Infrastructure Condition	Open Lawn/ Turf Area	Amenities																
				Tennis Courts	Basketball Courts	Baseball Fields	Soccer Fields	Mulitpurpose Fields	Fitness Zones	Skate Parks	Picnic Shelters	Playgrounds	Swimming Pools	Splash Pads	Dog Parks	Gymnasiums	Community/Rec Centers	Senior Centers	Restrooms	Total
William S. Hart Regional Park	Good																			0
	Fair																1		4	5
	Poor																	1	2	3
Totals:	Good			0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	2
	Fair			5	11	3	0	4	1	1	3	9	6	0	1	1	7	0	12	64
	Poor			0	0	0	0	1	0	0	0	0	1	0	0	0	0	1	3	6

AMENITY CONDITIONS SUMMARY



William S. Hart Regional Park

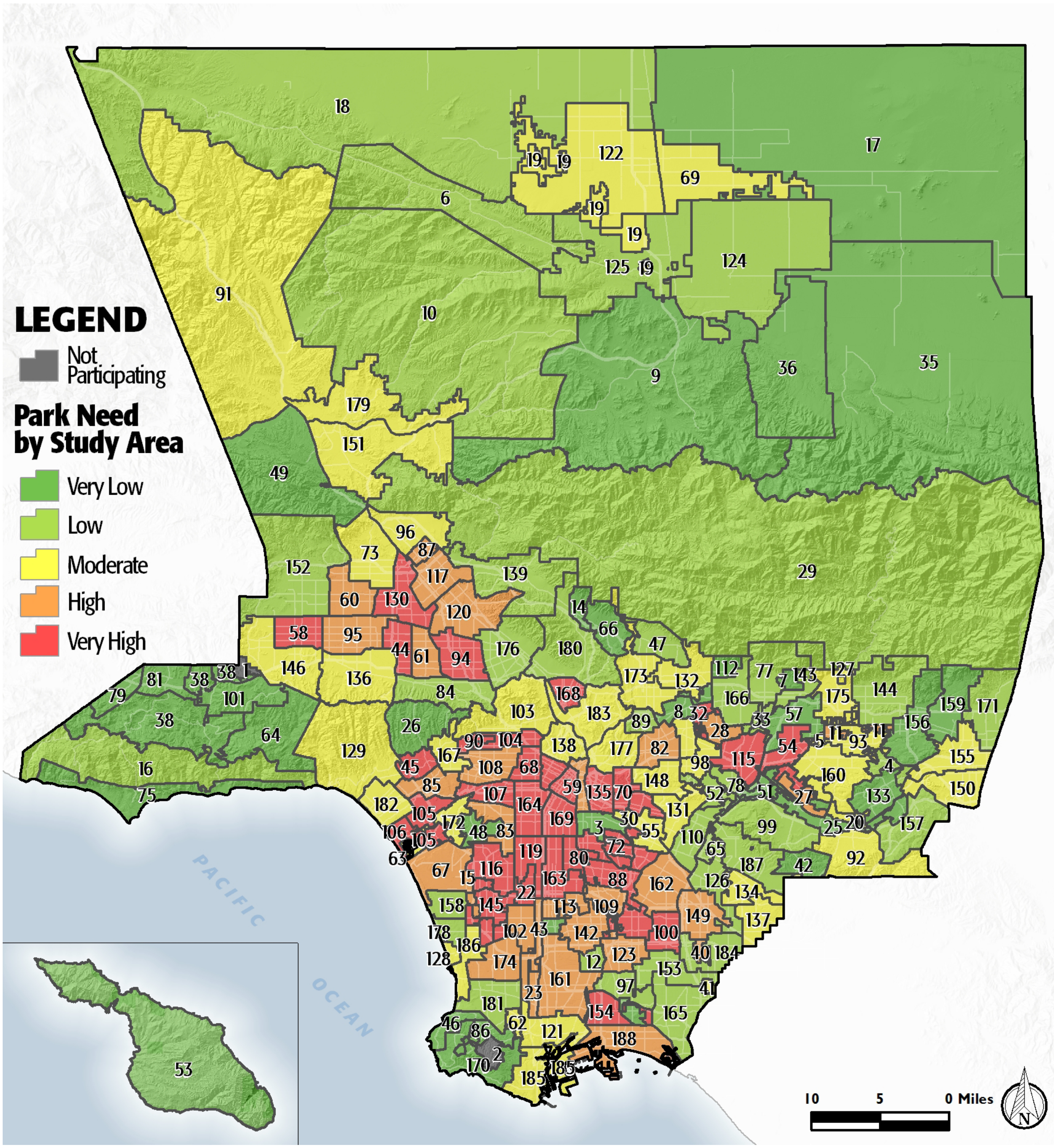
Miles of trails inside parks: 4.5

Miles of trails outside of parks: 0.7

PARK NEEDS FRAMEWORK: COUNTYWIDE ASSESSMENT OF NEED

The results of the analysis of the park metrics were used to determine an overall park need level for each Study Area. Please refer to Section 3.0 Park Needs Framework of the main report for additional information.

Santa Clarita - South (#151) has a moderate park need.



PROJECT COST ESTIMATES

Study Area: Study Area ID

Santa Clarita - South

151

Prioritized Projects

Project Number	Project Description		Cost
1	Replace Infrastructure/General at Santa Clarita Sports Complex Phase V		$25,130,000
2	Add Playgrounds at Santa Clarita Sports Complex Phase V		$500,000
3	Add Multipurpose Field- Grass at Santa Clarita Sports Complex Sports Fields		$1,864,000
4	Replace Infrastructure/General at Old Orchard Park		$5,280,000
5	Add Trails at Sand Canyon		$1,085,000
6	Build New Park in the General Vicinity of Pioneer Oil Refinery Site		$6,680,000
	New Park Tasks:		
	Infrastructure/General	$4,780,000	
	Trails	$350,000	
	Amphitheater	$1,550,000	
9-10	Build New Park in the General Vicinity of Rivendale Park		$8,080,000
	New Park Tasks:		
	Infrastructure/General	$6,280,000	
	Amphitheater	$1,550,000	
	Picnic Shelters	$250,000	

Study Area Total Costs

TOTAL COST FOR PRIORITIZED PROJECTS		$48,619,000
TOTAL DEFERRED MAINTENANCE*		$50,540,066
Replace amenities in "poor" condition	$23,262,000	
Repair amenities in "fair" condition	$27,278,066	
GRAND TOTAL		$99,159,066

Each Study Area prioritized 10 projects. These project lists are not intended to supersede or replace any planning documents, nor to obligate the lead agency to implement these projects. For further discussion of projects, please refer to the "Potential Park Projects and Cost Estimates" section of the report.

**Does not include repairs or replacement projects listed as prioritized projects.*

Study Area Name:

Santa Clarita South

Prioritized Project Reporting Form

Please provide descriptions of the park projects prioritized during your Study Area's community engagement workshop. The details you provide will contribute to cost estimates that will be included with your projects in the final report of the LA Countywide Park Needs Assessment. Please be as specific as possible by providing all details that may have an impact on cost estimates (including quantities and acres where appropriate). Along with this form, please attach copies or scans of all voting forms presented at your engagement workshop.

Please return this form to rrobinson@parks.lacounty.gov **no later than February 29, 2016**

1. Project Name: Santa Clarita Sports Complex Phase V Infrastructure

   Project Location (address, assessor's parcel number, or nearest intersection):

   20880 Centre Point Parkway (east of Golden Valley Road)

   Project Type (choose one):

   - [ ] Repairs to Existing Amenities
   - [x] Add/Replace Amenities in Existing
   - [ ] Build New Park or Specialty Facility (include acreage in description) Brief

   Description of Project:

   General Infrastructure improvements including completion of the perimeter road, parking lots, restrooms, walkways, security lighting, irrigation, landscaping, signage, fencing and gates.

2. Project Name: Santa Clarita Sports Complex Phase V Play Area

   Project Location (address, assessor's parcel number, or nearest intersection):

   20880 Centre Point Parkway (east of Golden Valley Road)

   Project Type (choose one):

   - ☐ Repairs to Existing Amenities
   - ☑ Add/Replace Amenities in Existing Park
   - ☐ Build New Park or Specialty Facility (include acreage in description)

   Brief Description of Project:

   Construct a universally accessible play area on approximately one acre.

3. Project Name: Santa Clarita Sports Complex Sports Fields

   Project Location (address, assessor's parcel number, or nearest intersection):

   20880 Centre Point Parkway (east of Golden Valley Road)

   Project Type (choose one):

   - ☐ Repairs to Existing Amenities
   - ☑ Add/Replace Amenities in Existing Park
   - ☐ Build New Park or Specialty Facility (include acreage in description)

   Brief Description of Project:

   Construct two lighted sports fields

4. Project Name: Old Orchard Park Rehabilitation

   Project Location (address, assessor's parcel number, or nearest intersection):

   25023 Avenida Rotella

   Project Type (choose one):

   - [ ] Repairs to Existing Amenities
   - [x] Add/Replace Amenities in Existing Park
   - [ ] Build New Park or Specialty Facility (include acreage in description)

   Brief Description of Project:

   General Infrastructure improvements on a five acre neighborhood park.

5. Project Name: Sand Canyon Trail Phases IV – VI

   Project Location (address, assessor's parcel number, or nearest intersection):

   Sand Canyon Road, north of Placerita Canyon Road

   Project Type (choose one):

   - [ ] Repairs to Existing Amenities
   - [ ] Add/Replace Amenities in Existing Park
   - [x] Build New Park or Specialty Facility (include acreage in description)

   Brief Description of Project:

   Phases IV-VI comprising the southern half of the 3.1 mile long trail consisting of lodgepole fencing, bridges over creeks and tributaries, retaining walls and signage.

6. Project Name: Pioneer Oil Refinery Site Infrastructure

   Project Location (address, assessor's parcel number, or nearest intersection):

   APN 2827-006-902

   Project Type (choose one):

   - [ ] Repairs to Existing Amenities
   - [ ] Add/Replace Amenities in Existing Park
   - [x] Build New Park or Specialty Facility (include acreage in description)

   Brief Description of Project:

   General infrastructure improvements on the City-owned 4.5 acre site. Improvements will include visitor serving amenities including an interpretive trail, shade structures and restrooms. A small amphitheater to accommodate educational programs will also be included. (2 Projects)

7. Project Name: Pioneer Oil Refinery Site Infrastructure

   Project Location (address, assessor's parcel number, or nearest intersection):

   APN 2827-006-902

   Project Type (choose one):

   - [ ] Repairs to Existing Amenities
   - [ ] Add/Replace Amenities in Existing Park
   - [x] Build New Park or Specialty Facility (include acreage in description)

   Brief Description of Project:

   See above proejct

8. Project Name: Rivendale Park (New)

Project Location (address, assessor's parcel number, or nearest intersection):

24255-24303 The Old Road, South of Calgrove Blvd. (APNs 2826-023-907, 909)

Project Type (choose one):

☐ Repairs to Existing Amenities

☐ Add/Replace Amenities in Existing Park

☑ Build New Park or Specialty Facility (include acreage in description)

Brief Description of Project:

Located on approximately 12 acres of City-owned property, this project will include general infrastructure improvements, picnic shelters with interpretive displays and a small amphitheater for educational programs and community performances. (2 Projects)

9. Project Name: Rivendale Park (New)

Project Location (address, assessor's parcel number, or nearest intersection):

24255-24303 The Old Road, South of Calgrove Blvd. (APNs 2826-023-907, 909)

Project Type (choose one):

☐ Repairs to Existing Amenities

☐ Add/Replace Amenities in Existing Park

☑ Build New Park or Specialty Facility (include acreage in description)

Brief Description of Project:

See above

10. Project Name:

Project Location (address, assessor's parcel number, or nearest intersection):

Project Type (choose one):

- ☐ Repairs to Existing Amenities
- ☐ Add/Replace Amenities in Existing Park
- ☐ Build New Park or Specialty Facility (include acreage in description)

Brief Description of Project:

If the projects reported on this form were subject to any type review process, please give a brief description of that process:

Each of these projects has been vetted through an extensive public engagement process including one or more of the following:

The City of Santa Clarita Parks, recreation and Open Space Master Plan (2008)

A project-specific community engagement process resulting in a Council-Approved Park Master Plan

Identified within the Santa Clarita 2020 Plan, adopted by the City Council in 2015

Please return this form to rrobinson@parks.lacounty.gov
no later than February 29, 2016

City of Santa Clarita

Parks, Recreation, and Open Space Master Plan Update

Prepared By
RJM Design Group, Inc.

CITY OF SANTA CLARITA

PARKS, RECREATION AND OPEN SPACE MASTER PLAN UPDATE

AUGUST 2008

Prepared For:
City of Santa Clarita
23920 Valencia Boulevard
Santa Clarita, CA 91355-2196

Prepared By:
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31591 Camino Capistrano
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ACKNOWLEDGEMENTS

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Frank Ferry, Mayor Pro Tem
Laurie Ender, Councilmember
Marsha McLean, Councilmember
Laurene Weste, Councilmember

Parks, Recreation, and Community Services Commission
Laura Hauser, Chair
Ed Redd, Vice Chair
Duane Harte, Commissioner
Ruthann Levison, Commissioner

City Manager
Kenneth R. Pulskamp

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Section One

1.0 INTRODUCTION

The Parks, Recreation, and Open Space Master Plan Update (Master Plan) is based on the vision that parks, recreation facilities, programs, trails, and open space are important resources within the City of Santa Clarita. Across the nation, organizations such as the California Park and Recreation Society describe the many important ways recreation facilities and programming can help in creating healthy lifestyles and livable communities, including:

- Strengthen community identity and sense of place
- Protect important places (environmentally, historically, aesthetically)
- Foster human development and education
- Support economic activity
- Increase cultural unity
- Promote health and wellness through physical activity
- Provide civic and social meeting places
- Strengthen families
- Increase vitality and distinctiveness of individual neighborhoods

A park or a recreation facility means different things to different people. To some residents, parks are active sports fields; others have images of passive open spaces where one can walk, rest, and enjoy nature. Still others may envision parks as places for community gatherings and events. Indeed, parks and recreation facilities are used for all of these purposes and more. A diverse, vital recreation system is therefore necessary in sustaining Santa Clarita’s visionary course.

Continuing the community-driven consensus process used in the successful development of previous parks as well as this Master Plan will be an important aspect of the successful evolution of Santa Clarita’s park system. Parks and recreation as the “client” and ultimately the end-user should maintain their critical role in the park development process. The Parks Planning Section within the Parks, Recreation and Community Services Department is critical to the successful design and development of parks that meet the needs of the community and fulfill the expectations of the citizens of Santa Clarita.

Key questions discussed in this Master Plan include: What parks, recreational facilities, and programs does Santa Clarita have? Who uses Santa Clarita parks, facilities, and programs? What role do parks, facilities, open space, and recreation programs have in the lives of residents? What types of parks, facilities, and programs does the Santa Clarita Valley need and which are the most important? What changes should be made to existing parks and facilities? Where will new parks, facilities, and programs be placed and how will they be funded and maintained?

1.1 Purpose of the Master Plan

The purpose of this Master Plan is to provide a realistic guide for the creative, orderly development and management of parks, recreation facilities and programs for the City, now and into the future. The Master Plan is an implementation tool of the General Plan, providing strategies for addressing the General Plan's Vision Statement, as well as goals and policies based on current analysis and community input.

Over the years, the City of Santa Clarita has actively undertaken a variety of planning efforts pertaining to individual Park Master Plans, Land Use studies, and Specific Plans. The Master Plan builds on many of these previous planning efforts and obtains new community input that has resulted in providing an up-to-date understanding of current and future recreation needs and opportunities specific to Santa Clarita.

This report is intended to be a flexible document, presenting findings and recommendations that will be evaluated, validated, and/or modified periodically as the City responds to unforeseen opportunities and constraints as well as changes in residents' needs and demands. It is anticipated that Master Plan recommendations will be considered on an annual basis in the context of other City priorities and, through incorporation into the City budget, so that recreation projects can begin the process of implementation.

It should be noted that this Master Plan includes a section on open space (Section 6) that summarizes various recent open space studies the City has undertaken. There is a strong connection between open space and recreation in Santa Clarita and Section 6 reflects the multiple roles of natural open space, from recreation to preservation of natural, visual, and cultural resources. Natural open space is also strongly connected to community identity in many ways, including as reinforcement of the areas "western" or early days heritage.

This report updates the Parks, Recreation, and Open Space Master Plan adopted by the City Council in 1995.

1.2 Approach and Document Organization

The Master Plan document is organized into the following sections:

Section One: Introduction

This section summarizes the Master Plan's purpose and process. The current demographic composition of Santa Clarita and implications of recreation trends is briefly outlined. A list of related documents that were reviewed as part of the Master Plan is identified.

Section Two: Existing Recreation Resources

Understanding the existing conditions in the community is an essential step in the Master Plan process. Section Two provides an inventory of City parks and recreation facilities as well as other recreation facilities open to the public and includes discussion of public school facilities, private recreation facilities, and a listing of other publicly-owned lands (opportunity sites) within and surrounding the City limits.

Section Three: Recreation Facility Needs Assessment

Section Three provides a detailed assessment of the recreation facility needs of the Santa Clarita community. Data from the community was obtained to develop an understanding of the demand for a variety of facilities. Both qualitative and quantitative information sources are discussed. The assessment utilizes the following needs identification tools:

Community Outreach: Information gathered from the community through a series of workshops, focus groups, stakeholder interviews, workshop participant questionnaires, and a sports organization survey

Community Telephone Survey: The phone survey provides current, statistically valid information specific to Santa Clarita that gives detailed information for the types of recreation facilities most often utilized by Santa Clarita residents. A total of 550 randomly selected, geographically distributed households in and adjacent to the City of Santa Clarita were interviewed.

Recreation Demand and Needs Analysis: An evaluation of selected current and future facility needs was developed using results from the telephone survey, sports organization survey, facility inventory, and relevant demographic projections

Service Area Analysis: An evaluation of how parks and recreation facilities are distributed throughout residential areas in Santa Clarita

Acreage Analysis: An evaluation of parkland acreage needs in the City based on established standards and on identified need for specific recreation facilities such as sports fields or courts

Program Needs Analysis: Evaluation of recreation program needs (Section Four) that generates facility needs.

Trends and Implications Report: A review of current literature and studies on state and national, social and recreational trends and patterns, and discussion of potential impacts on recreation in the City of Santa Clarita.

Section Four: Recreation Programs

Section Four provides an inventory of City recreation programs and services and a discussion of other recreation programs and services open to the public through private and non-profit providers. Using similar needs identification tools and prioritization processes as those outlined in detail in Section Three (for facilities), program needs are discussed and prioritized. Recommendations are provided that address identified programming needs.

Section Five: Recreation Facility Recommendations

Section Five provides recommendations with respect to existing and proposed parks, unimproved parkland, and joint use and collaborative or partnering opportunities. Recommendations are intended to address the recreation facility and program needs identified in Sections Three and Four and are the result of existing inventory, analysis of demand, community input, and consideration of established goals and policies.

Section Six: Open Space

Natural open space and trails plans, maps, and work plans are discussed in the context of existing and proposed recreation facilities. A "big picture" concept of a system of trails and open spaces is described.

Section Seven: Funding and Implementation

Sources for funding capital costs, as well as operations and maintenance costs, are identified, and current funding strategies are briefly discussed. Capital costs are assigned to the proposed recommendations discussed in Section Five and suggested funding sources are identified to assist the City in implementing the proposed Master Plan recommendations.

Appendix (separate document)

The Appendix contains many of the full original reports (trends analysis, demand and needs analysis, etc.) summarized in the Master Plan.

1.3 Context

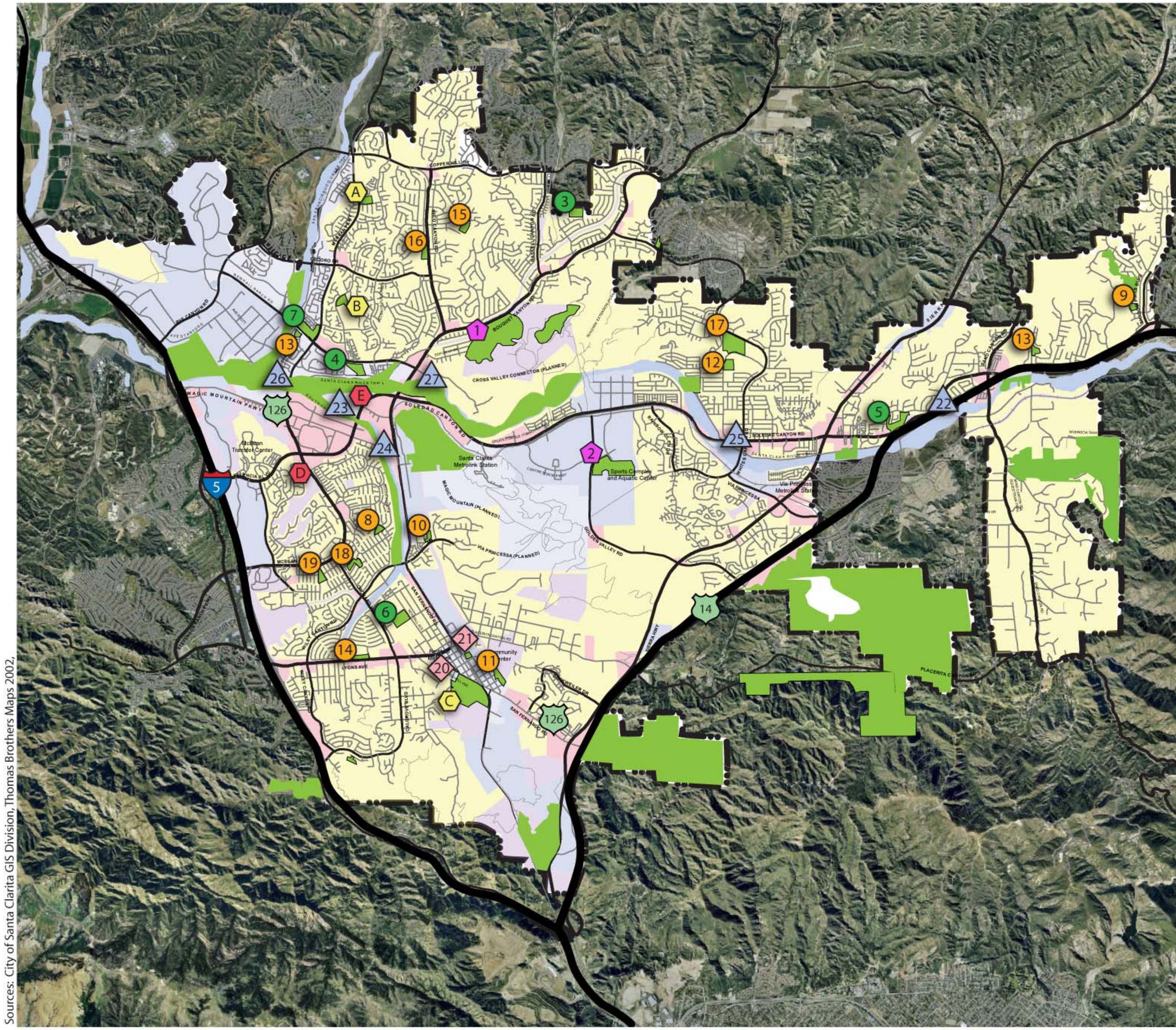
Santa Clarita is a unique City recognized for its open space, diverse housing options, neighborhood orientation, and economic opportunities. The desirability of the area, coupled with the position of the City near population centers, has resulted in rapid growth and development over the last decade, spurring renewed planning efforts.

2.4 Existing City Recreation Facilities

Unique and diverse recreational opportunities are available throughout Santa Clarita in City facilities. One can find natural open spaces, trails, community buildings, streams, sports courts and fields, a disc golf course, swimming pools, passive areas, playgrounds, a skate park, equestrian staging areas, and much more. As a City that has emerged over the past few decades, newer areas of Santa Clarita have benefited from planning efforts that reflect relatively current thinking about neighborhood identity, neighborhood parks, and developer participation in recreation facility implementation. This has led to an effective system of diverse parks, strongly associated with adjacent residential areas and important to overall community identity. This is one of the many strengths of the community, although some neighborhood park gaps remain in older areas. Additional neighborhood parks are planned as part of future residential areas. Another strength of the park system is the passive/special use parks and trails that take advantage of open space and natural areas of the community.

Exhibit 2.4-1 is a map showing the location of each existing park and Exhibit 2.4-2 is a matrix that describes size and features of existing public parks and recreation facilities within the City of Santa Clarita. More than 342 gross acres of park and open space are found in these twenty-one (21) City facilities.

Exhibit 2.4-1: Location of Existing Parks and Recreation Facilities



Sources: City of Santa Clarita GIS Division, Thomas Brothers Maps 2002.

LEGEND - PARKS

CITY

REGIONAL PARKS

1 Central Park
2 Santa Clarita Sports Complex

COMMUNITY PARKS

3 Bouquet Park
4 Bridgeport Canyon Park
5 Canyon Country Park
6 Newhall Park
7 Valencia Heritage Park

NEIGHBORHOOD PARKS

8 Almendra Park
9 Begonias Lane Park
10 Circle J Ranch Park
11 Creekview Park
12 North Oaks Park
13 Oak Spring Canyon Park
14 Old Orchard Park
15 Pamplico Park
16 Santa Clarita Park
17 Todd Longshore Park
18 Valencia Glen Park
19 Valencia Meadows Park

CITY

SPECIAL USE FACILITIES

20 Veterans /Historical Plaza
21 Newhall Community Center

TRAILS AND TRAILHEADS

22 Lost Canyon Trailhead
23 Auto Ctr/Pony League Trailhead
24 South Fork Trailhead
25 Camp Plenty Trailhead
26 Promenade Trailhead
27 River Village Trailhead

COUNTY

PARKS

A Chesebrough Park
B Northbridge Park
C William S. Hart Park

PRIVATE

PARK/REC FACILITIES

D Summit Park
E William S. Hart Little League Complex

FREEWAY
MAJOR ARTERIAL (4-6 LANES)
COLLECTOR STREETS

EXHIBIT 2.4-1
EXISTING PARKS AND RECREATION FACILITIES MAP

DATE: 06/23/08

RJM DESIGN GROUP, INC. PLANNING AND LANDSCAPE ARCHITECTURE

0 1/2 1 2 mi

PARKS, RECREATION, AND OPEN SPACE MASTER PLAN
CITY OF SANTA CLARITA, CALIFORNIA

Exhibit 2.4-2: Current Facility Inventory

Exhibit 2.4-2 CITY OF SANTA CLARITA EXISTING CITY PARK and RECREATION FACILITIES					PARK/PICNIC FACILITIES																ATHLETIC FACILITIES																		
		Parcel Acreage[1]	Parkland Acreage[2]	Undeveloped	Amphitheater	Barbeques	Bike Rack	Community Building/Office	Dog Park	Horse Staging Area	Kitchen	Meeting / Class Rooms	Open Passive Turf / Grass (Acres)	Parking	Pedestrian Walkway (lighted)	Playground / Tot Lot	Picnic Shelters / Gazebos	Picnic Tables	Restroom	Trail / Paseo Linkage	Ball Diamond (used for Baseball/Softball)	Basketball (indoor-in Gymnasium)	Basketball (outdoor)	Concession Building	Disc Golf - 9 hole	Exercise (Par) Course	Football (Programmed)	Gymnasium	Handball / Raquetball (Indoor)	Horseshoes	Multi-Purpose Field (used for Football, Soccer, Rugby, Lacross) L	Organized Sports Played (F-Football, Lacross, R-Rugby, S-Soccer)	Shuffleboard	Softball	Skate Park	Soccer (Programmed)	Swimming Pool	Tennis Court	Volleyball (Sand)
KEY	CITY RECREATION FACILITIES																																						
REGIONAL PARKS																																							
1	Central Park	108.00	80.00	28			•	•	•				1.5	•	•	1		19	3		4L		3	•	•						8L	F,L,R,S				4			
2	Santa Clarita Sports Complex	60.00	20.00	40			•	•			•	•	1.8	•					1			2		•				•	•						1		3		
COMMUNITY PARKS																																							
3	Bouquet Canyon Park	10.50	9.00	1.5		•							2.1	•	•	1		10	•		1L		1L									F				1		2L	
4	Bridgeport Park	16.00	16.00				•						2	•	•	1		4	•	•	1L/1											F,S				1			
5	Canyon Country Park	19.30	17.20	2.1		•		1			•	1	3.4	•	•	2	2	21	1		1P					1						S				1			
6	Newhall Park	14.30	14.30			•	•	1				1	6.2	•	•	1	1	30	1	•	1L		2	•								F,S	1			1	1		
7	Valencia Heritage Park	17.20	17.20			•	•						1.5	•	•	1	•	7	1	•											2L	F,R,S				2		3L	
NEIGHBORHOOD PARKS																																							
8	Almendra Park	4.30	4.30				•						3.2		•	1	5	•		•			1																
9	Begonias Lane Park	4.20	4.20				•						2.2		•	1	1	12	1				1L																
10	Circle J Ranch Park	5.30	5.30				•						0.6	•	•	1	•	1	1													S							
11	Creekview Park	5.00	5.00				•						2.5		•	1	•	7	1				1																1
12	North Oaks Park	2.30	2.30			•		•				•	0.3	•	•	3		8	1																		1		
13	Oak Spring Canyon Park	5.70	5.00	0.7			•						1.8		•	1	1	6	1				0.5																
14	Old Orchard Park	5.40	5.40			•	•	1				•	1.2	•	•	2		8	1	•	1P		1L									S				1			
15	Pamplico Park	7.60	5.00	2.6			•						2.3	•	•	2		2	•				(2) .5																
16	Santa Clarita Park	7.50	7.30	0.2		•	•	1			•	2	1.3		•	2		20	•		1L/1		1L							1		F, S				1	1		
17	Todd Longshore Park	31.60	5.00	26.6	•		•						1.1	•	•	1	•	9	•																				
18	Valencia Glen Park	7.30	5.50	1.8		•	•	1				•	3.9	•	•	2		9	•	•			1L														1	2L	
19	Valencia Meadows Park	6.10	4.80	1.3			•	1				•	1.3	•	•	1		15	1	•	1P		1														1		
SPECIAL USE FACILITIES																																							
20	Veterans Historical Plaza	0.50	0.50										0.1		•																								
21	Newhall Community Center	4.50	4.50				•	1				1	0.4		•	1	•		•			•	•					•											
	TOTAL ACREAGE	342.60	237.80	104.80																																			
TRAILS AND TRAILHEADS																																							
22	Lost Canyon Trailhead																			•																			
23	Auto Center/Pony League Trailhead													•						•																			
24	South Fork Trailhead									•				•			•			•																			
25	Camp Plenty Trailhead													•						•																			
26	Promenade Trailhead													•						•																			
27	River Village Trailhead									•				•				•		•																			

DEFINITIONS

L = Lighted

P = Practice Field/Court

[1] From 2006 OVOV General Plan (Draft)

[2] From 1995 General Plan

It is worthwhile noting items of special interest:

- Central Park is the most used park in the City as reported by the highest number of households (32%) polled in a community-wide telephone survey.
- The vast majority (96%) of residents are very satisfied or somewhat satisfied with existing recreation facilities and programs in Santa Clarita.
- More than nine of every ten respondents (96%) rated Santa Clarita Valley recreation facilities maintenance as “Excellent” or “Good”.
- The City hosts major regional events at Central Park, Santa Clarita Sports Complex and other sites.
- Veterans Historical Plaza opened in 2005. This park is one of the few of its kind in the County dedicated exclusively to the memory of military veterans.

Several facilities in Santa Clarita provide recreation opportunities, but are not controlled or operated by the City. Recreation elements for the County facilities are quantified and credited toward the inventory of available recreation resources since they are public facilities that residents can use. In addition to the County parks, there are two (2) private facilities that are utilized by sports organizations in the City, they are included in the demand and needs analysis. Exhibit 2.4-3 is a matrix that describes size and features of these facilities.

Exhibit 2.4-3: Other Facilities Open to the Public

	OTHER RECREATION FACILITIES WITHIN THE CITY	Parcel Acreage	Amphitheater	Barbeques	Bike Rack	Community Building/Office	Drinking Fountain	Horse Staging Area	Kitchen	Meeting / Class Rooms	Open Passive Turf / Grass (Acres)	Parking	Pedestrian Walkway (lighted)	Playground / Tot Lot	Picnic Shelters / Gazebos	Picnic Tables	Restroom	Trail / Paseo Linkage
			PARK/PICNIC FACILITIES															
COUNTY PARKS																		
A	Chesebrough Park	5.20					•				0.8	•		1		6	•	
B	Northbridge Park	5.90					•				1					5		
C	William S. Hart Park	265.00				•					6				1	3		•
PRIVATE PARKS AND RECREATION FACILITIES																		
D	Summit Park	80.00												2	2	2		
E	William S. Hart Little League Complex																	

	OTHER RECREATION FACILITIES WITHIN THE CITY	Ball Diamond (used for Baseball)	Basketball (indoor-in Gymnasium)	Basketball (outdoor)	Bleachers (All parks with ball diamonds)	Concession Building	Disc Golf - 9 hole	Exercise (Par) Course	Football (Programmed)	Gymnasium	Handball / Raquetball (Indoor)	Horseshoes	Multi-Purpose Field (used for Football, Soccer, Rugby, Lacross)	Organized Sports Played (F-Football, L-Lacross, R-Rugby, S-Soccer)	Shuffleboard	Softball	Skate Park	Soccer (Programmed)	Swimming Pool	Tennis Court	Volleyball (Sand)
		ATHLETIC FACILITIES																			
COUNTY PARKS																					
A	Chesebrough Park															1					
B	Northbridge Park			2					1									1			
C	William S. Hart Park																				
PRIVATE PARKS AND RECREATION FACILITIES																					
D	Summit Park																			3L	
E	William S. Hart Little League Complex	7														3					

- Friendly Valley Golf Course
- Robinson Ranch Golf Course
- Valencia Country Club
- Vista Valencia Golf Course

This Master Plan Update does not provide a detailed inventory of private facilities since the City neither controls, maintains, ensures availability, nor programs them. These recreation resources are therefore not credited toward satisfaction of the City's acreage goals for public parks. However, as they do fill a recreation role, these facilities may individually be able to address certain specific identified needs in the City of Santa Clarita.

A component of this Master Plan is to review how existing public/private partnerships may be working in the provision of facilities and programs. Facility recommendations include an analysis of how private facilities could assist in meeting the needs for specific types of recreation programs.

2.8 Opportunity Sites

Throughout this Master Plan process numerous sites have been evaluated for the potential to provide recreational opportunities in the community. Several "opportunity sites" are currently planned as developer-built parks. Many are unplanned vacant park sites, and some are currently utilized for other purposes but may become available for recreational use in the future. A few sites are part of the Santa Clarita open space network and have favorable access and topographic characteristics that could accommodate more active recreation facilities.

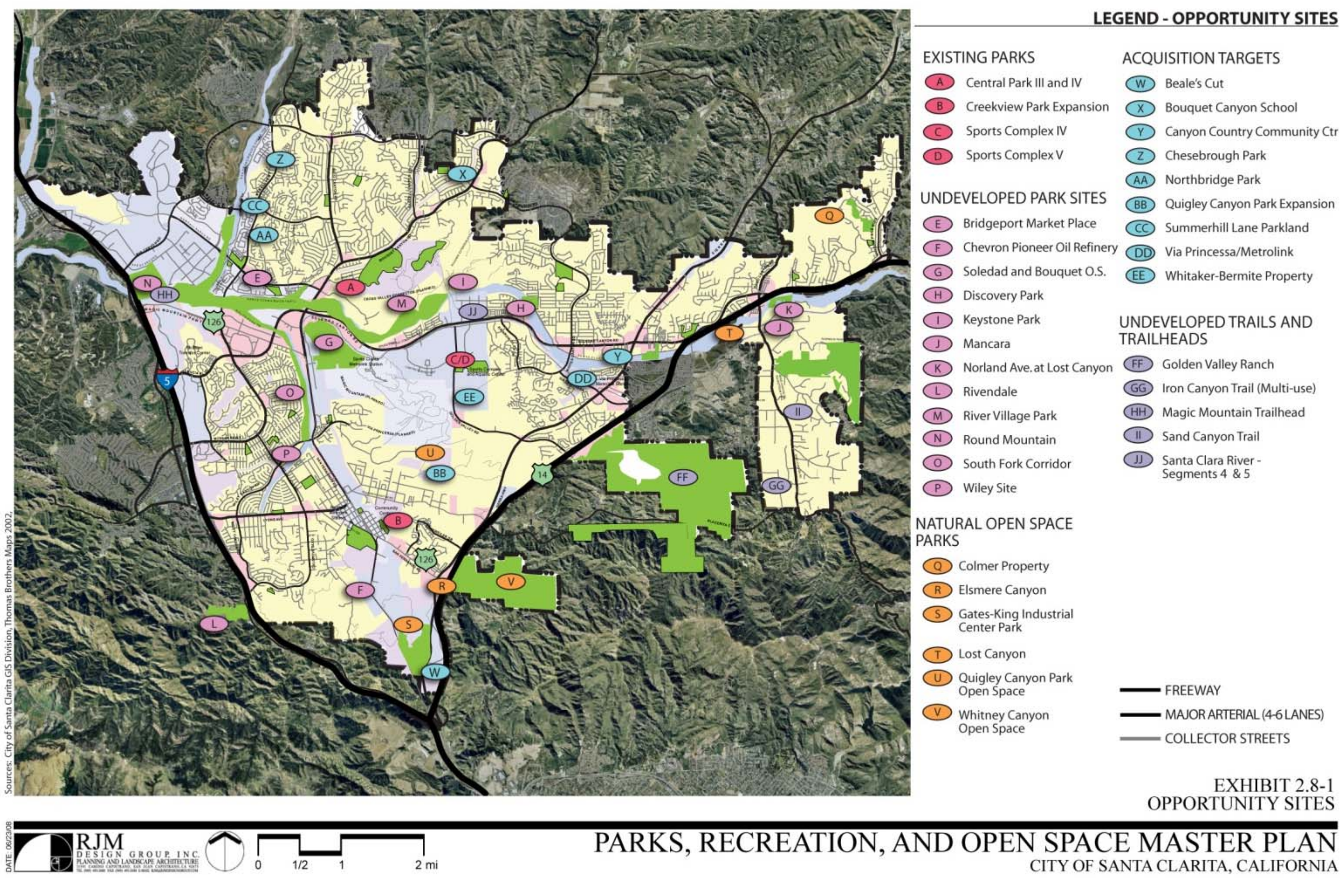
There are five (5) categories of opportunity sites indicated:

- **Existing Parks:** Parks that are partially developed and, although they have been master planned, have undeveloped acreage.
- **Undeveloped Park Sites:** These sites are either owned by the City or are within approved developments with required park acreage. Owned sites are subject to a master planning and environmental process that will determine amount of developable acreage. Some sites that are already planned to become active public recreation facilities, including developer-built parks and City projects, are also listed and indicated as planned facilities.

- **Natural Open Space Parks:** Areas owned by the City or a Joint Powers Authority of which the City is a member, and which have either significant development constraints or for which there have been expectations for primarily passive use. Some are currently used for passive recreation despite limited improvements.
- **Acquisition Targets:** Developed or undeveloped sites offering recreational opportunities, not currently owned by the City or under the City's control.
- **Undeveloped Trails and Trailheads:** Planned and potential trail connections and/or trailheads.

Locations of these sites are shown on Exhibit 2.8-1.

Exhibit 2.8-1: Locations of Opportunity Sites



Existing Parks

Central Park Phase III and IV: Approximately 28 acres are available for development, which could include a new community center and a multi-court tennis center.

Creekview Park Expansion: Owned by The Masters College, and adjacent to an existing 5-acre City park, this area is mostly in the floodplain of Newhall Creek. Passive area development on the opposite side of the creek would require a bridge for pedestrian and maintenance access, and could be deeded to City as part of approval of College Master Plan.

Sports Complex Phase IV and V: Phase IV will include a new signature ±40,000 SF skate park replacing an existing 12,000 SF facility. Also planned are outdoor basketball courts, an open play area, and new gymnasium with indoor basketball. Future development will include a universally access play area, soccer fields, amphitheater, dog park, and a BMX course.

Undeveloped Park Sites

Bridgeport Market Place: The City will soon own this 5-acre flat property at the intersection of Grandview and Newhall Ranch Road. It was part of a negotiation with City Council as mitigation for the River Village Project. It is the site of a known earthquake fault, no habitable structures are allowed. It has been used in the past as parking for special events at Bridgeport Park across the street. It has been discussed as a special event staging area (5K runs, art festivals, pet clinics, etc).

Chevron/Pioneer Oil Refinery Site: Approximately 5 acres in size, and offers a significant historic preservation opportunity.

Soledad & Bouquet Open Space: The City owns this 235-acre property, but it is not yet master-planned. Topography is very hilly and there are spectacular views of the entire Valley. Protection of the ridgelines and the topography reduce the developable size of the property. Trail connections should be considered. This site is adjacent to the 900-acre Whitaker-Bermite property (Brownfield site) and the reclaimed wastewater plant.

***Discovery Park*:** This is a City-owned 24+ acre site with a significant floodplain area. A Master Plan Design and Construction Documents, as well as a CEQA document, has been completed for approximately 10 acres of passive river park improvements. Phase I has been completed and consists of a trail connection to Camp Plenty Trailhead.

Keystone Park: Keystone is a proposed developer built park that may include passive areas, splash pad play area, picnicking, and an off -leash dog area.

Mancara Park: Mancara is a proposed developer built park that may include passive areas, play area, and picnicking.

Norland Avenue at Lost Canyon: 58 acres of City-owned property, however more than 50% of the property is in the floodplain. Bank protection and mitigation will be costly in order to use any significant portion of the remainder of this site. This could be a possible donor site for other project mitigation.

Rivendale: 60 acres of City-owned property located at the mouth of Towsley Canyon. It is currently used by the Santa Monica Mountain Conservancy as a trailhead for access to the Towsley property. A Flood Plain, SEA, and steep topography are major constraints. Historically, the site was used for equestrian boarding. There is freeway visibility, access, and noise.

River Village Park: 29-acre site dedicated to the City (subject to City accepting improvements). Construction plans for 5-acre active park features are being reviewed by staff. The remainder of the site has both natural and manufactured slopes with oak trees and a trail connection to Newhall Ranch Road. The expected construction date is 2010.

Round Mountain: The City will soon own this property at the intersection of Interstate-5 and the Santa Clara River, as part of a negotiation to provide mitigation for the River Village Project. The floodplain, limited vehicular access, existing utility corridor, and potential endangered species are possible constraints. The upland area is bisected by Santa Clara River Trail Segment One (currently under construction). There may be potential for limited access from the industrial park to the north.

South Fork Corridor: The City will soon own property both in and alongside the South Fork of the Santa Clara River. The existing South Fork Trail runs the length of the property. It was also acquired as part of a negotiation for the River Village Project.

Wiley Site: Anticipated as mitigation for nearby high density mixed use development. A major utility corridor, floodplain, and limited vehicular access are potential issues.

Natural Open Space Parks

Colmer Property: Property consists of natural and manufactured slopes behind homes. No public access is currently available.

Elsmere Canyon: The Santa Monica Mountains Conservancy currently owns 400 acres at the mouth of this pristine oak woodland. Additional acquisition is needed to permanently protect the upper canyon including scenic seasonal stream and water fall.

Gate King Industrial Center Park: *A* very hilly and oak-studded area. Anticipated use is limited to trails. The Environmental Impact Report (EIR) restricts any more intensive use.

Lost Canyon: Developer proposed neighborhood park. Site to be determined.

Quigley Canyon Park: 158 acres of mostly hilly topography with a blue line stream bisecting. Several existing trails occur on the site.

Whitney Canyon Open Space: Owned by a Joint Powers Agreement (JPA) between the City and the Santa Monica Mountains Conservancy. Master plan would be processed through their approval.

Acquisition Targets

Beale's Cut: An undetermined area of land in Newhall Pass that includes the site of the 90-foot deep cut completed in 1864 as a toll road linking the San Fernando Valley with the Santa Clarita Valley and points north.

Bouquet Canyon School: Approximately 5-acre site across the street from the existing Bouquet Canyon park. School District is planning to relocate to a new site and the property could be available to the City and/or other public agencies for acquisition.

Canyon Country Site: Possible site for a future community center.

Cheseborough Park: This park is owned and programmed by the County of Los Angeles. If acquired by the City, this park must be brought up to operations and maintenance standards.

Northbridge Park: This park is owned and programmed by the County of Los Angeles. If acquired by the City, park must be brought up to operations and maintenance standards.

Quigley Canyon Park Expansion: This 158-acre oak woodland is located in Placerita Canyon. Approximately ten acres are currently part of an oak tree bank established for a nearby development.

Summerhill Lane Parkland: A flat 3.5 acre site on the corner of McBean and Summerhill. This site has excellent access, no known constraints, and is adjacent to the City's open space and trail system. A Metropolitan Water District (MWD) easement is adjacent to the west.

Via Princessa/Metrolink Site: City-owned property currently serving as commuter rail station and parking lot. On opposite side of the railroad tracks is an additional 11 acres owned by the County of Los Angeles. Grade separated access would be required to connect the two parcels.

Whitaker-Bermite Site: Developer is planning 50 acres of parkland including one community park. This is a 900-acre Brownfield site. The City Council has maintained that no portion of this site can be developed until entire site is clear of hazardous materials and groundwater. An earthquake fault runs along the northerly property line.

Undeveloped Trails and Trailheads

Golden Valley Ranch Trail: A multi-use trail system exists on 900-acre open space preserve. Additional trails to be constructed as part of adjacent residential development.

Iron Canyon Trail (Multi-use): A multi-use trail connecting adjacent semi-rural areas with the Sand Canyon Trail Corridor.

Magic Mountain Trailhead: Located on Magic Mountain Parkway near Tourney Road, the site of a proposed two acre trailhead facility.

Sand Canyon Trail : A multi-use trail connecting the National Forest areas to the south with the Santa Clara River Trail. Completion of this trail is approximately 30% complete.

Santa Clara River Segments 4 and 5: These are the remaining segments of the Santa Clara River Trail along the north bank of the river through the City. When constructed, these trails will complete a significant portion of the trail corridor extending from Interstate 5 to Discovery Park in Canyon Country.

Section Three

3.0 RECREATION FACILITY NEEDS ASSESSMENT

The purpose of the facility needs assessment process is to identify the current and future recreation facility needs within the community, to identify recreation demand that is unmet, and to suggest the relative priority of each identified need. Needs were identified and prioritized by engaging the community in a series of community outreach forums and other needs identification tools listed below. The process involved gathering both qualitative input (e.g. workshops, focus groups, questionnaires, stakeholder interviews) and quantitative input (e.g. telephone survey, sports organization survey, demand analysis). Qualitative input is the voice of the community. Quantitative input is statistically valid information. Using only qualitative feedback as a basis for the number, type, and location of recreation facilities ignores the fact that such feedback may not be representative of the entire community and also may not quantify facility needs beyond "more". Each needs identification tool and each bit of information gathered is a piece of the recreation puzzle leading to a more thorough understanding of the community. All of the pieces, taken together, provide an overall picture of recreation facility needs specific to Santa Clarita now and in the future.

The following methods and processes (needs identification tools) were utilized in the facility and program needs assessment and will be addressed in this section:

Community Outreach: Information was gathered from Santa Clarita residents and stakeholders through a variety of methods including: a series of three (3) workshops, workshop participant questionnaires, staff focus group, stakeholder interviews, community focus group, and a sports organization survey.

Community-Wide Telephone Survey: The telephone survey provides current, statistically valid information specific to Santa Clarita that provides detailed information on the types of recreation facilities and programs most often utilized by Santa Clarita and nearby residents. A total of 550 randomly-selected, geographically distributed telephone interviews were completed with the adult head of the household.

Recreation Facility Demand and Needs Analysis: Quantitative evaluation of Santa Clarita facility needs based on the statistically valid telephone survey, facility inventory, relevant demographics, and sports organization survey.

Service Area Analysis: Evaluation of where parks and recreation facilities are distributed throughout residential areas in Santa Clarita.

Acreage Analysis: Evaluation of parkland acreage needs in Santa Clarita based on a goal of 5 acres per thousand residents, identified recreation needs, and available supply.

Maintenance and Operations Analysis: Site visits and analysis of maintenance and operations practices.

Program Needs Analysis: Evaluation of recreation program needs (see Section Four) that generates facility needs.

Trends Analysis: Evaluation of societal trends and associated recreation implications.

3.1 Community Outreach

The community outreach effort ranged from lively evening workshop discussions to one-on-one stakeholder interviews. The community outreach portion of the Needs Assessment provided a number of opportunities to obtain perspective from residents, users of facilities and programs, and providers of facilities and programs. Within this section, the community outreach effort has been organized into eight (8) separate needs identification tools, they are:

- Community Workshop #1 – Community Characteristics and Issues
- Community Workshop #2 – Sports Facilities
- Workshop Participant Questionnaires
- Stakeholder Interviews
- Staff Focus Group
- Community Focus Group
- Community Workshop #3 – Program and Facility Needs Prioritization
- Sports Organization Survey

Another needs identification tool included in the community outreach effort, the Citywide Telephone Survey, is discussed separately in section 3.2. The information received from each of these sources has been included in the overall prioritization of needs and recommendations. A brief summary of each community input is provided below, and the complete summary is included in the Appendix document.

Community Workshop #1 – Community Characteristics and Issues

The first community workshop was held on June 11, 2007. Thirty-eight (38) residents attended the workshop. The purpose of Workshop #1 was to identify the most important community characteristics that contribute to why Santa Clarita is a great place to live, work, and play. Workshop participants also listed trends, and/or issues that may be impacting those attributes and how Parks, Recreation, and Community Services can support important community characteristics.

According to the workshop participants, the community characteristics that make Santa Clarita a great place to live, work, and play are:

- Safety
- Wide variety of activities and facilities
- Good schools
- Family values
- Natural areas

Issues or trends that may negatively impact those characteristics include:

- Growth/overdevelopment
- Traffic (need better public transit)
- Loss of hillsides/ridgelines

When asked about the role parks and recreation can play to support positive community characteristics, respondents indicated:

- Provide a wide variety of facilities and activities for all groups/ages
- Listen to the residents/encourage resident participation
- Maintain current activities
- Preserve open space

Community Workshop #2 – Sports Facilities

On July 18, 2007, residents and representatives of sports user groups in Santa Clarita were invited to discuss park issues relating to sports and active use of park facilities. Thirty (30) attendees participated in the evening's workshop discussions. Representatives from sports groups were asked to participate because of their extensive familiarity with athletic facilities and with the organizations that tend to use them. The workshop participants discussed the best and worst sports facilities in the City, the sports facility needs, and opportunities to meet those needs.

The top sports facilities identified were:

- Central Park (multi-use, variety, lighted fields, well maintained)
- Santa Clarita Sports Complex (multi-use, growth potential, clean)
- Aquatic Center (state of the art, fitness/competition/recreation, variety of uses)

The worst sports facilities identified were:

- Newhall Park (poor lighting, safety, lack of activities, small parking lot)
- Bouquet Canyon Park (softball field, upkeep)

Top sports facility needs include:

- Multi-Use Fields
- Gymnasium/Indoor Basketball Courts
- Tennis Facility/Courts
- BMX Facility
- Special Needs Park

When asked about opportunities to meet current and future sports facility needs, participants identified the following:

- Expand or renovate existing parks
- Joint Use Agreements/partnerships
- Acquire vacant or open space land

Workshop participants indicated that the three most important improvements to Santa Clarita's park, recreation, and open space network are:

- New, expanded, or renovated parks
- Lighting in parks
- Provide active parks

Workshop Participant Questionnaires

During the first two (2) workshops, a questionnaire was distributed and completed by a total of forty-eight (48) workshop participants. Consistent themes and issues raised by respondents include:

- Santa Clarita parks are in excellent/good condition
- Tennis courts are needed

Stakeholder Interviews

Interviews were held on September 17 and 18, 2007. Each interview was conducted over a period of 45 to 60 minutes. A total of fourteen (14) stakeholders were interviewed and a table summarizing all stakeholder comments is included in the Appendix.

When asked what are the most important issues related to Parks, Open Space, Recreation Facilities, and Services currently provided, the most common responses (by at least three of the fourteen interviewees) included:

- Acquire, preserve, maintain open space, greenbelts and ridgelines/Integrate open space plan with Master Plan
- Keeping pace with growth/current deficit in parks, facilities, and open space
- Acquisition, construction, accessibility, and connectivity of multi-use trails
- Meeting recreational needs of the future

When asked what are the important services and facilities for the future, respondents indicated:

- Tennis courts that meet NTA standards for competition
- Provide parks and recreation facilities in multiple locations/identify gaps in services (e.g. Canyon Country)
- Amphitheater/outdoor theater
- Communicate/coordinate with areas proposed for annexation to guarantee quality park system
- Big League Dreams – fields for youth and adult baseball/regional baseball complex
- Dog parks
- Aquatics facilities (e.g. play pool at Newhall, Olympic sized pool)
- More performing arts venues
- More parkland/walkable, accessible communities/plans for pedestrians

In answer to the question about what the Department does best in providing services the most common responses (by at least three of the interviewees) included:

- Good services/good department/everything
- Variety and quality of recreational services with high participation for diverse community
- Creating new parks and opportunities for recreation
- Good maintenance of parks and facilities
- Staff have pride in their work and the City

In answer to the question about how the Department could improve in providing recreation services and facilities, the most common response (by at least three of the interviewees) included:

- Acquire and develop more open space and parkland

When asked if there were any particular segment of the population that is currently underserved, the most common responses were:

- Growing older adults
- At risk youth/teens
- Canyon Country residents

Interviewees most often indicated that opportunities to provide programs, services, and facilities were:

- More partnering with other entities for outreach, facilities, and program development (e.g. environmental groups, health and wellness groups, College of the Canyons, school district, and private sector)

Interviewees expressed their vision for recreation facilities and services in 2017. The most common responses include:

- City meets national park standards (5 acres of parkland per thousand residents)
- Maintain vision for greenbelts and link trails with communities
- Greatly increase open space and passive parklands around City, ensure accessibility

When asked what the one recreation facility most desired to see added to meet the needs of the community, the most common responses included:

- Community center/recreation facility to serve Canyon Country
- Sports Park/community center/senior center in eastside

Staff Focus Group

A discussion session with City staff members was held on October 1, 2007.

When asked what are the Parks, Recreation, and Community Services Department's greatest strengths and assets in meeting the needs of residents, the most common responses included:

- Dedicated Staff and teamwork
- Provide well-maintained facilities
- Listens to the community

Consensus responses indicate that the most important recreation issues include:

- Expand facilities and programs
- Traffic (parking in parks, location of facilities)
- Safety in parks (park rangers needed)

The greatest constraints/challenges in meeting the needs of residents are:

- Budgets and funding
- Need full-time Staff/Staff specialists
- Ability to offer new programs

Participants expressed their vision for parks, open space, facilities, and services in 2017:

- Provide multiple diverse programs and activities to serve all interests and ages
- Provide safe facilities

Priorities that the Department needs to address to better serve community residents included:

- Teen programs
- Community center with facilities for arts, teens, and seniors

Participants indicated that the following needs to be done to accomplish priority items:

- Assess and prioritize needs
- Identify funding opportunities and secure funding
- Make it happen

A table summarizing all focus group comments is included in the Appendix document.

Community Focus Group

A discussion session with community leaders was held on October 1, 2007.

When asked what are the most important issues related to parks, open space, recreation facilities and services currently provided, participants provided a long and diverse set of responses. Items most often indicated include:

- Lack of therapeutic recreation
- Activity center in Canyon Country
- Decentralized facilities
- Gallery space for artists and public art

Parks, open space, recreation facilities, and recreation services can be improved as follows:

- Enhance partnerships with non-profits
- Ensuring more open space
- Communication of services
- Accessible playgrounds for all ages and abilities
- Decentralize facilities
- Natural areas with interpretation and environmental education

A full summary of the session can be found in the Appendix document.

Community Workshop #3 – Needs Summary and Prioritization

On November 28, 2007, members of the Santa Clarita community and participants from previous workshops were invited to an overview of the Master Plan process, and summary of the recreation facility and program needs in the City. Thirty-two (32) attendees participated in the evening's workshop discussions. Participants discussed relative priority of needs. According to workshop participants, the top recreation facilities needed in Santa Clarita are:

- Lighting in Parks
- Teen/Youth Center
- Special Needs Facility
- Senior Center
- Open Space
- Multi-purpose Fields

A full summary of the workshop can be found in the Appendix document.

Sports Organization Survey

To supplement the information regarding participation in organized sports obtained from the Community Telephone Survey, a questionnaire was designed and distributed to the sports organizations that use public facilities. Detailed information was requested for each division in the group regarding the number of players, the size of facility required, and the time and place of all games and practices. Twenty (20) sports organizations responded. Information was received from softball, baseball, football, soccer, volleyball, BMX, fishing, and basketball organizations. The full summary of the sports organization survey can be found in the Appendix.

This information is used to better define peak day demand and convert that to the number of facilities required to meet the needs of this segment of the recreation market (see Section 3.3, Recreation Demand and Needs Analysis).

Sports groups also answered qualitative questions about facility needs for their organizations. Responses include:

- Ballfield maintenance is generally perceived as "good" to "excellent",
- Soccer field maintenance is generally rated "fair" to "excellent",
- Baseball and softball organizations requested more fields for games and practices,
- Soccer organizations requested more fields, lights, and maintenance adjustments,
- Football organizations requested more fields for games and practice and more parking,
- Basketball and volleyball organizations requested more gymnasiums and less reliance on schools, and
- BMX and fishing groups requested facilities in Santa Clarita.

3.2 Community-Wide Telephone Survey

A total of 550 interviews were completed with adult head of households living in the Santa Clarita Valley. These respondents were contacted through the use of a random digit dial sample. This sample methodology compensates for the incidence of unlisted telephone numbers. Survey eligibility was confirmed by verifying that the respondent's home was located within one of nine eligible postal codes.

These 13-minute interviews were conducted via telephone by professional interviewers during the August and September 2007 fielding of the resident telephone survey using direct-entry computer technology. All interviews conducted among Santa Clarita Valley residents were edited by skilled supervisors of the field organization and 10% were validated for accuracy.

The sample error for a sample size of 550 ranges from +/-1.9% to +/-4.3% (depending on the response distribution) at the 95% confidence level. This means that if we were to survey every household in Santa Clarita, we are confident that, 95% of the time, the results for a question would differ by less than 4.3 percentage points from the results derived from this sample.

Responses to the survey questions provide vital information, including:

Frequency of Use: Almost half (42%) of Santa Clarita households reported being a frequent user of park and recreation facilities (utilizing recreation facilities at least three (3) times a month) while another forty percent (40%) described themselves as moderate users (patrons of facilities two to twenty-four times annually). This pattern is comparable to the average of other communities studied.

Most Used Facility: Central Park was reported as the most often used park by the highest percentage of households (32%). Canyon Country Park, Santa Clarita Sports Complex, and Old Orchard Park were also mentioned often.

Most Common Recreation Activities: Of the fourteen (14) activities tested in the survey, the largest share of the population reported participation during the last year in: Passive Use of Open Grass in Public Recreation Facilities (65%), Trail Use for Active Recreation (56%), Picnicking at Picnic Tables in Public Parks (55%), and Walking on Public Trails for Passive Relaxation (54%). Bicycling and swimming were activities reported next most often. Walking/Jogging/Running/Hiking was most often reported among households located in Sub-area 4 (postal zip codes 91354 and 91355).

Activities Location: Santa Clarita is the location for at least 84% of all reported recreation activities. Twelve of the fourteen tested activities occur in Santa Clarita more than 90% of the time.

Facilities Maintenance: Nearly all respondents (96%) indicated that maintenance of facilities in Santa Clarita is “Excellent” or “Good”, representing an above-average positive rating compared with other communities surveyed. Almost all (99%) respondents said that facility maintenance is very important or somewhat important in their decision to use those facilities.

Overall Satisfaction: More than nine in ten (96%) stated they were either “Very Satisfied” or “Somewhat Satisfied” with existing recreation facilities and programs in the Santa Clarita Valley.

Most Desired Active Facility: The active recreation facilities cited as most desired by Santa Clarita residents surveyed were Swimming Pool for Recreation (7%), Tennis Courts (5%), Bike Trails (5%), Walking/Running/Jogging Paths (4%), Dog Park (4%), and Skateboard Park (4%). One in five (20%) indicated their household members have no new recreation facilities needs.

Most Desired Passive Facility. The passive recreation facilities cited as most desired by Santa Clarita residents surveyed were Walking Trails (21%), Open Space (12%), Outdoor Concert Stage (12%), Performing Arts Center (9%), Library (6%), and Open Grass Areas (5%).

A key element of the telephone survey is information that generates participation rates in each of fourteen (14) recreational activities. These participation rates are analyzed in the recreation demand and needs analysis (Section 3.3), where facility demand is calculated in relationship to the population served.

3.3 Recreation Facility Demand and Needs Analysis

This section summarizes the evaluation of demand for fourteen (14) recreation and park activities based upon actual participation rates as determined by the residents of Santa Clarita. A key element in any park and recreation planning strategy is an understanding of the nature of demand for parks and recreation facilities. Without this understanding, policy can only be based on general standards, such as population ratios (acres per thousand population) or service area (distance to park facility).

Such standards are useful, but the demand analysis guarantees that the needs assessment reflects Santa Clarita specifically.

The National Recreation and Park Association, in their 1983 update to the publication *Recreation, Park and Open Space Standards and Guidelines,* states: "Park and recreation services are community services." Ideally, the national standards should stand the test in communities of all sizes. However, the reality often makes it difficult or inadvisable to apply national standards without question to specific locales. The uniqueness of every community, due to differing geographical, cultural, climatic, and socioeconomic characteristics, makes it imperative that every community develop its *own* standards for recreation, parks and open space."

The information used to calculate community demand for recreation facilities comes from four sources:

- The Communitywide Telephone Survey
- Santa Clarita Population Projections
- Sports Organization Survey
- California State Department of Parks and Recreation

The telephone survey provides a statistically valid basis for determining how the residents of Santa Clarita participate in recreation activities. The participation rates in recreation activities from the survey constitute a quantitative basis for the demand analysis that is used in calculating the current need for facilities.

The nature of growth and population change establishes trends in demand for recreation and leisure services. These population projections, together with the survey results describing participation rates for various demographic measures, is the basis for a quantitative projection of future facility needs.

In terms of sports facilities, it should be noted that the analysis pertains to participation in sports games on game fields, for which quantitative inventory is possible. This information is obtained in part from the sports organization survey. Participation in sports practices and evaluation of practice field demand is not included, in part because practices often occur on informal, non-regulation facilities.

Further, it is assumed that practices can occur on game fields during non-peak portions of the season. Based on the responses received from the sports organization survey there appears to be a need for additional practice fields in baseball, softball, football, and soccer.

The sports organization survey obtained information regarding the number of players and teams in each league or sports organization, age ranges of the players, what seasons they play, if they travel outside Santa Clarita to play, if they participate in tournaments, ratings of field/facility maintenance and scheduling, projections of growth, and facilities they have the greatest need for both now and in the future. Detailed information was requested for each division in the sport regarding the number of players, the size of facility required, and the time and place of all games and practices.

This information is used as a supplement to the telephone survey results and as a means to better define peak day demand (number of participants who will be involved in a given activity on the busiest day of the year) and convert that to the number of facilities required to meet the needs of this segment of the recreation market. Information regarding which of the existing facilities are currently being used by the sports groups provides an understanding of the inventory of sports facilities regarding usage for adult sports, youth sports, and practices.

Recreation Facility Requirements

The demand for certain recreation facilities is calculated based upon actual participation rates as determined from the telephone survey. The facility demand for each of the selected activities is determined based upon current and future population figures. The total facility demand is compared to the existing facility inventory which results in a surplus or deficit.

Of the fourteen (14) activities surveyed two were identified as having a current surplus of facilities (youth softball and swimming pools); the remainder show current deficits (see Exhibit 3.3-1).

Exhibit 3.3-1: 2007 Facility Needs

Facility	Facility Need Ratio - City of Santa Clarita	2007 Needs	Existing City Facilities	Surplus/ Deficit(-)	School Facilities Avail.*	Other Facilities Avail.	Total Facilities Avail.	Total Surplus/ Deficit(-)
Softball Fields: Organized Youth	1/15,850 pop.	11.2	9.0	-2.2	0.0	3.0	12.0	0.8
Baseball Fields: Organized Youth	1/20,900 pop.	8.5	0.0	-8.5	0.0	7.0	7.0	-1.5
Soccer Fields Organized Youth	1/6,250 pop.	28.3	11.0	-17.3	10.0	1.0	22.0	-6.3
Football Fields Organized Youth	1/35,650 pop.	5.0	0.0	-5.0	5.0	0.0	5.0	0.0
Indoor Basketball Cts.: Organized Youth/Adult	1/22,350 pop.	7.9	2.0	-5.9	5.5	0.0	7.5	-0.4
Tot Lots/Playgrounds	1/5,000 pop.	35.5	26.0	-9.5	0.0	3.0	29.0	-6.5
Picnic Tables	1/850 pop.	210	193	-17	0	16	209	-1
Swimming Pools (Public) Recreational	1/39,750 pop.	4.5	6.9 **	2.4	0.0	0.0	6.9	2.4
Tennis Courts	1/2,750 pop.	64.8	7.0	-57.8	3.0	3.0	13.0	-51.8
Walking/Jogging Paths (mi.)	1/3,700 pop.	47.7	37.0 ***	-10.7	0.0	15.0	52.0	4.3
Walking Paths (mi.)	1/4,250 pop.	41.5	37.0 ***	-4.5	0.0	15.0	52.0	10.5
Bicycling Paths (mi.)	1/3,400 pop.	51.9	29.0 ****	-22.9	0.0	0.0	29.0	-22.9
Skate Boarding Facility	1/65,650 pop.	2.7	1.0 *****	-1.7	0.0	0.0	1.0	-1.7
Open Grass in Parks (acres)	1/2,250 pop.	78.3	45.2	-33.1	0.0	7.8	53.0	-25.3

*School facilities other than fields are counted at 50 percent to allow for time not available to the public.
**The City has 8 pools with a combined 42,600 sq. ft. - equivalent to 6.9 pools measuring 25 meters x 25 yards.
***There are a total of 37 miles of paths maintained by the City. It is assumed that these paths are used for both walking/jogging for exercise and also walking for pleasure.
****Paved Class I Off-Road Trails.
*****Existing skate park to be demolished.

Source: Coman Consulting, Inc., based on data from California State Department of Parks and Recreation and the Santa Clarita Recreation Needs Assessment Survey, October 2007.

SC/demand - 5/12/08

Exhibit 3.3-2: Facility Needs at Build-Out

Facility	Facility Need Ratio - City of Santa Clarita	Buildout Needs	Existing City Facilities	Surplus/ Deficit(-)	School Facilities Avail.*	Other Facilities Avail.	Total Facilities Avail.	Total Surplus/ Deficit(-)
Softball Fields: Organized Youth	1/15,850 pop.	15.0	9.0	-6.0	0.0	3.0	12.0	-3.0
Baseball Fields: Organized Youth	1/20,900 pop.	11.4	0.0	-11.4	0.0	7.0	7.0	-4.4
Soccer Fields Organized Youth	1/6,250 pop.	38.0	11.0	-27.0	10.0	1.0	22.0	-16.0
Football Fields Organized Youth	1/35,650 pop.	6.7	0.0	-6.7	5.0	0.0	5.0	-1.7
Indoor Basketball Cts.: Organized Youth/Adult	1/22,350 pop.	10.6	2.0	-8.6	5.5	0.0	7.5	-3.1
Tot Lots/Playgrounds	1/4,700 pop.	50.6	26.0	-24.6	0.0	3.0	29.0	-21.6
Picnic Tables	1/890 pop.	268	193	-75	0	16	209	-59
Swimming Pools (Public) Recreational	1/37,600 pop.	6.3	6.9 **	0.6	0.0	0.0	6.9	0.6
Tennis Courts	1/2,550 pop.	93.2	7.0	-86.2	3.0	3.0	13.0	-80.2
Walking/Jogging Paths (mi.)	1/3,550 pop.	67.1	37.0 ***	-30.1	0.0	15.0	52.0	-15.1
Walking Paths (mi.)	1/4,150 pop.	57.1	37.0 ***	-20.1	0.0	15.0	52.0	-5.1
Bicycling Paths (mi.)	1/3,250 pop.	73.0	29.0 ****	-44.0	0.0	0.0	29.0	-44.0
Skate Boarding Facility	1/59,550 pop.	4.0	1.0 *****	-3.0	0.0	0.0	1.0	-3.0
Open Grass in Parks (acres)	1/2,250 pop.	105.1	45.2	-59.9	0.0	7.8	53.0	-52.1

*School facilities other than fields are counted at 50 percent to allow for time not available to the public.
**The City has 8 pools with a combined 42,600 sq. ft. - equivalent to 6.9 pools measuring 25 meters x 25 yards.
***There are a total of 36 miles of paths maintained by the City. It is assumed that these paths are used for both walking/jogging for exercise and also walkinf for pleasure.
****Paved Class I Off-Road Trails.
*****Existing skate park to be demolished.

Source: Coman Consulting, Inc., based on data from California State Department of Parks and Recreation and the Santa Clarita Recreation Needs Assessment Survey, October 2007.

SC/demand - 5/12/08

These deficits will increase (see Exhibit 3.3-2) as the population grows to ultimate build-out unless facilities are added. The largest deficit numbers anticipated at build-out are represented by:

- Soccer fields (16)
- Tot lots/playgrounds (22)
- Tennis courts (80)
- Bicycle Trails (44 miles)
- Open Turf in Parks (52 acres)

Perhaps the most significant future deficits relative to availability of parkland are sports fields. Provision of 3 softball fields, 5 baseball fields, and 16 soccer fields to meet needs would require more than 75 acres of land. It should be noted that a factor is included in demand calculations to account for resting of sports fields; 20% of availability is assumed for resting and recovery of fields.

Some of the more costly facility deficits based on cost per square foot are indoor basketball courts (3 needed) and skateboard facility (equivalent of 4 needed). Recreational swimming pool quantities are anticipated to remain in numbers appropriate to the population, even if no new pools are built.

3.4 Service Area Analysis

In addition to providing appropriate quantities and types of recreation facilities, the City strives to provide them in useful and appropriate locations. Service Area Analysis was conducted with respect to neighborhood parks and to community centers.

Neighborhood Park Service Area Analysis

One-half (.5) mile is approximately a 20-minute walk for most people. It is generally considered a significant threshold in distance, beyond which some segments of the population will tend to decline walking opportunities.

Most residences should be within one-half mile, a convenient walkable distance for most people, of a neighborhood park or other park that may satisfy common recreation needs. This .5 mile radius around parks and recreational facilities is defined as a neighborhood park "service area". In essence, the existing parks are providing a nearby location for residents to utilize for active or passive recreation. This service area emphasis is key in a community in which families, neighborhoods, and active living are central issues, and is supported by the Vision and Guiding Principles developed as part of the Santa Clarita Valleywide General Plan process:

Housing developments located in the more urbanized communities of the Valley shall be designed to create a sense of neighborhood by…promoting walkability and containing places that serve as centers of activity and identity (schools, multi-purpose facilities, parks, convenience services, neighborhood commercial centers, etc). Guiding Principle 20.a

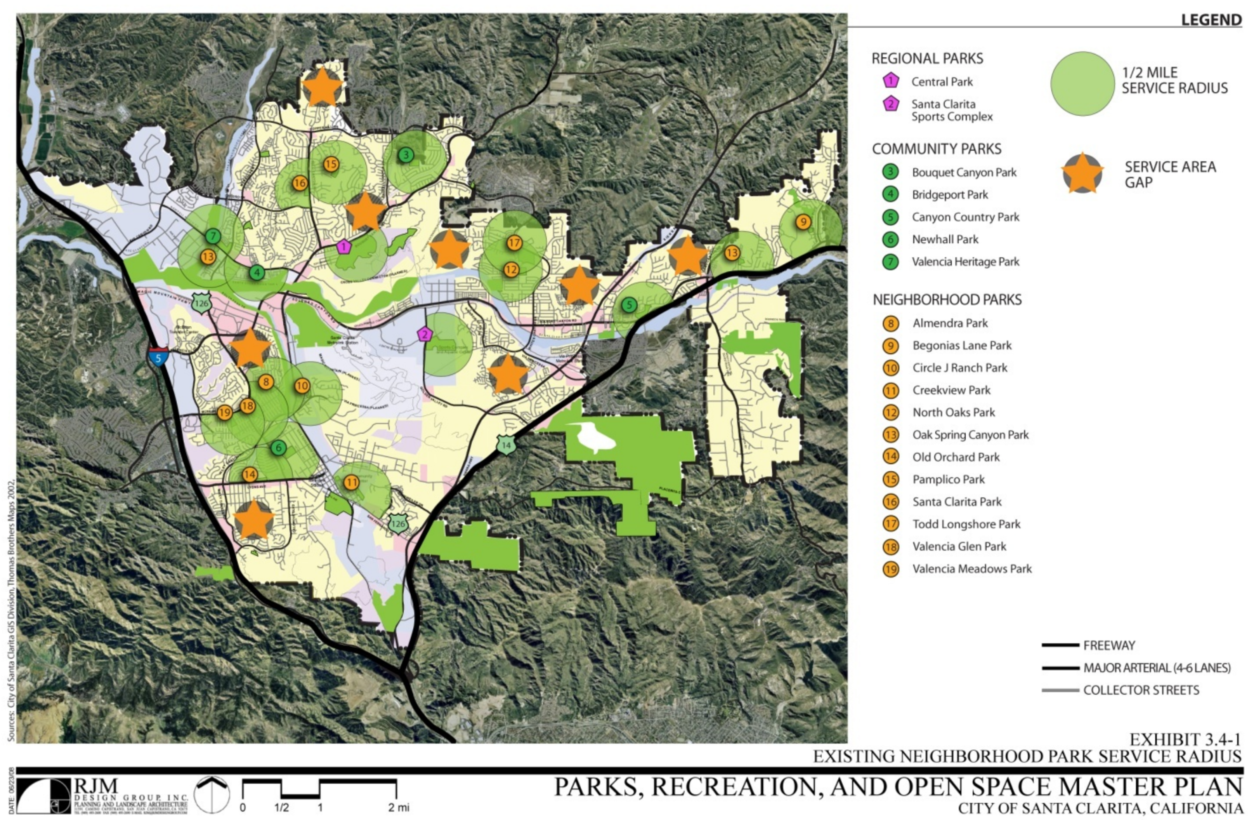
And:

New parklands will be developed throughout the Santa Clarita Valley, with priority on locations that are not now adequately served. These shall encompass a diversity of park types and functions, including passive and active areas, in consideration of the recreational needs of the residents to be served.
Guiding Principle 36

Proximity to parks is more than a convenience issue. It helps to establish an excellent City park system by providing improved air quality, circulation, social opportunities, community identity, and community health benefits. Proximity to parkland is one of the elements identified as predicting levels of physical activity in the community, and a survey of U.S. adults finds that people with access to neighborhood parks were nearly twice as likely to be physically active as those without access to parks. Further, 43% of people with safe places to walk within ten minutes of home met recommended activity levels, while just 27% of those without safe places to walk were active enough to meet recommended activity levels (Active Living by Design, Land Use Fact Sheet).

To analyze the extent to which the distribution of existing Santa Clarita facilities is appropriate, a service area radius map is provided (see Exhibit 3.4-1). Circular service area radii are generated with the park location as the central radius point. Geographical or other physical obstructions should be considered in analysis of actual service area, so service area shapes are not necessarily full circles but may be truncated to reflect a major barrier, such as an arterial roadway. When areas zoned for residential use fall outside graphic service area designations, it can be said that the area may be underserved by the existing parks.

Exhibit 3.4-1: Service Area Radius Map and Service Gap Areas



The service area analysis demonstrates that there are eight (8) residential areas outside of the established .5 mile service radius from a developed neighborhood park:

- Area north of Soledad Canyon Road, east of Sierra Hwy
- Area north of Soledad Canyon Road, west of Sierra Hwy
- Area south of Via Princessa, west of Sierra Hwy
- Area between Bouquet Canyon Road and the Santa Clara River
- Area north of Bouquet Canyon Road around Haskell Canyon Road
- Area north of Copper Hill Drive
- Area south of Valencia Blvd, east of McBean Parkway
- Area south of Lyons Avenue, west of Calgrove Blvd

Gaps in service can be addressed by adding a new facility, expanding existing facilities, or by making available an existing facility, such as a school, that has not been previously available for recreation.

There are additional rural, low-density residential areas not within .5 mile of a public park, primarily in Sand Canyon. This area is not considered a priority gap area because of the large residential parcels and availability of private open space for recreation.

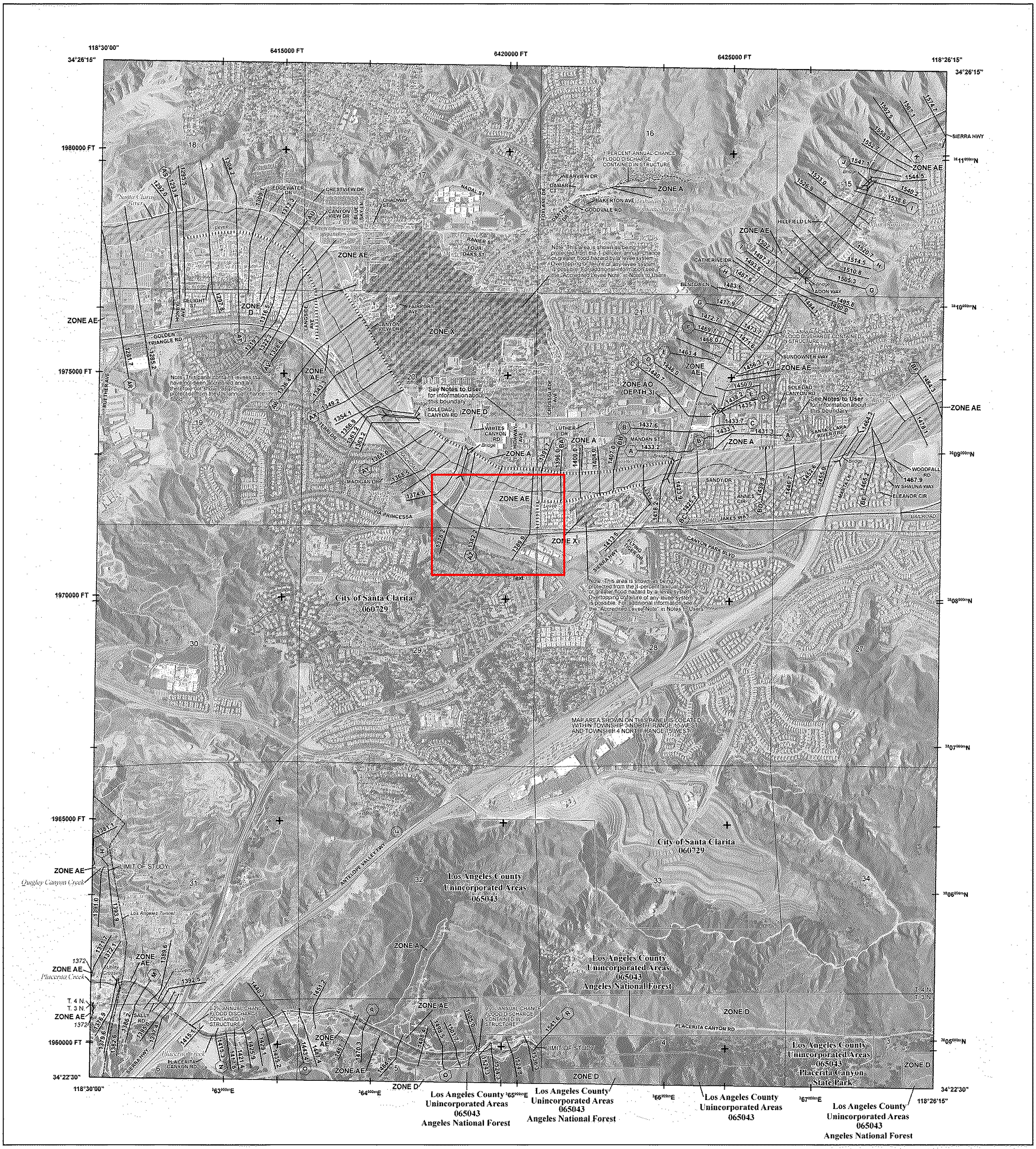
Community Center Distribution

Since transportation to community centers is often by car, bike, or public transportation, the idea of a fixed service radius figure is not as useful as it is for neighborhood parks where convenience and walking distance are factors. However, it is still helpful to analyze community center locations in geographically large cities such as Santa Clarita in order to determine if distribution is generally equitable and effective. A map is generated to identify general areas in which community centers are absent or are limited (See Exhibit 3.4-2). This analysis will aid in prioritizing recommendations described in Section Five.

It can be said that the following areas are deficient in community centers.

- Central Santa Clarita around the Soledad and Bouquet Open Space opportunity site identified in Section 2.8
- Eastern Santa Clarita around the Canyon Country opportunity site identified in Section 2.8

During the needs analysis process of this report, the need for a community center in the eastern portion of Santa Clarita was expressed by community participants. The community building in Canyon Country Park, located on Exhibit 3.4-2, does not have the size or flexibility of use usually provided by a significant community center facility.



FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT HTTPS://MSC.FEMA.GOV

SPECIAL FLOOD HAZARD AREAS	Without Base Flood Elevation (BFE) *Zone A, V, A99*
	With BFE or Depth *Zone AE, AO, AH, VE, AR*
	Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD	0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
	Future Conditions 1% Annual Chance Flood Hazard *Zone X*
	Area with Reduced Flood Risk due to Levee See Notes *Zone X*
OTHER AREAS	NO SCREEN Areas of Minimal Flood Hazard *Zone X*
	Area of Undetermined Flood Hazard *Zone D*
GENERAL STRUCTURES	Channel, Culvert or Storm Sewer
	Levee, Dike or Floodwall
	(E) 18.2 / 17.5 Cross Sections with 1% Annual Chance Water Surface Elevation (BFE)
	(8) Coastal Transect
	Coastal Transect Baseline
	Profile Baseline
	Hydrographic Feature
	513 Base Flood Elevation Line (BFE)
OTHER FEATURES	Limit of Study
	Jurisdiction Boundary

NOTES TO USERS

For information and questions about this map, available products associated with this FIRM including historic versions of this FIRM, how to order products or the National Flood Insurance Program in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website. Users may determine the current map date for each FIRM panel by visiting the FEMA Map Service Center website or by calling the FEMA Map Information eXchange.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was derived from digital orthophotography collected by the U.S. Department of Agriculture Farm Service Agency. This imagery was flown in 2014 and was produced with a 1-meter ground sample distance.

ACCREDITED LEVEE NOTES TO USERS: Check with your local community to obtain more information, such as the estimated level of protection provided (which may exceed the 1-percent-annual-chance level) and Emergency Action Plan, on the levee system(s) shown as providing protection for areas on this panel. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures. For more information on flood insurance, interested parties should visit the FEMA website at http://www.fema.gov/business/nfip/index.shtm

ATTENTION: The levee, dike, or other structure that impacts flood hazards inside this boundary has not been shown to comply with Section 65.10 of the NFIP Regulations. As such, this FIRM panel will be revised at a later date to update the flood hazard information associated with this structure.

SCALE

N

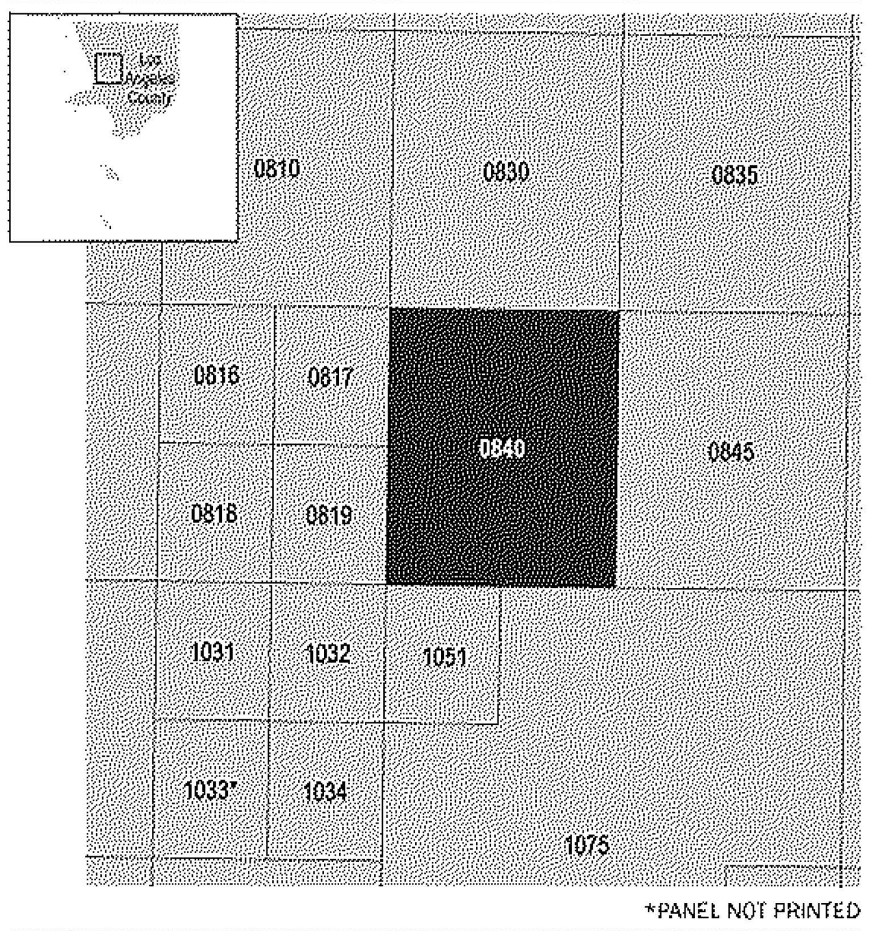
Map Projection:
Universal Transverse Mercator Zone 11N; North American Datum 1983; Western Hemisphere; Vertical Datum: NAVD 88

1 inch = 1,000 feet 1:12,000

0 1,000 2,000 4,000 feet

0 250 500 1,000 meters

PANEL LOCATOR



*PANEL NOT PRINTED

FEMA

National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM

FLOOD INSURANCE RATE MAP

LOS ANGELES COUNTY, CALIFORNIA

and Incorporated Areas

PANEL **840** OF **2350**

FEMA

Panel Contains:

COMMUNITY	NUMBER	PANEL	SUFFIX
LOS ANGELES COUNTY	065043	0840	G
SANTA CLARITA, CITY OF	060729	0840	G

VERSION NUMBER
2.3.3.2

MAP NUMBER
06037C0840G

MAP REVISED
JUNE 2, 2021

Honby Channel Field Photos
Nov 2021

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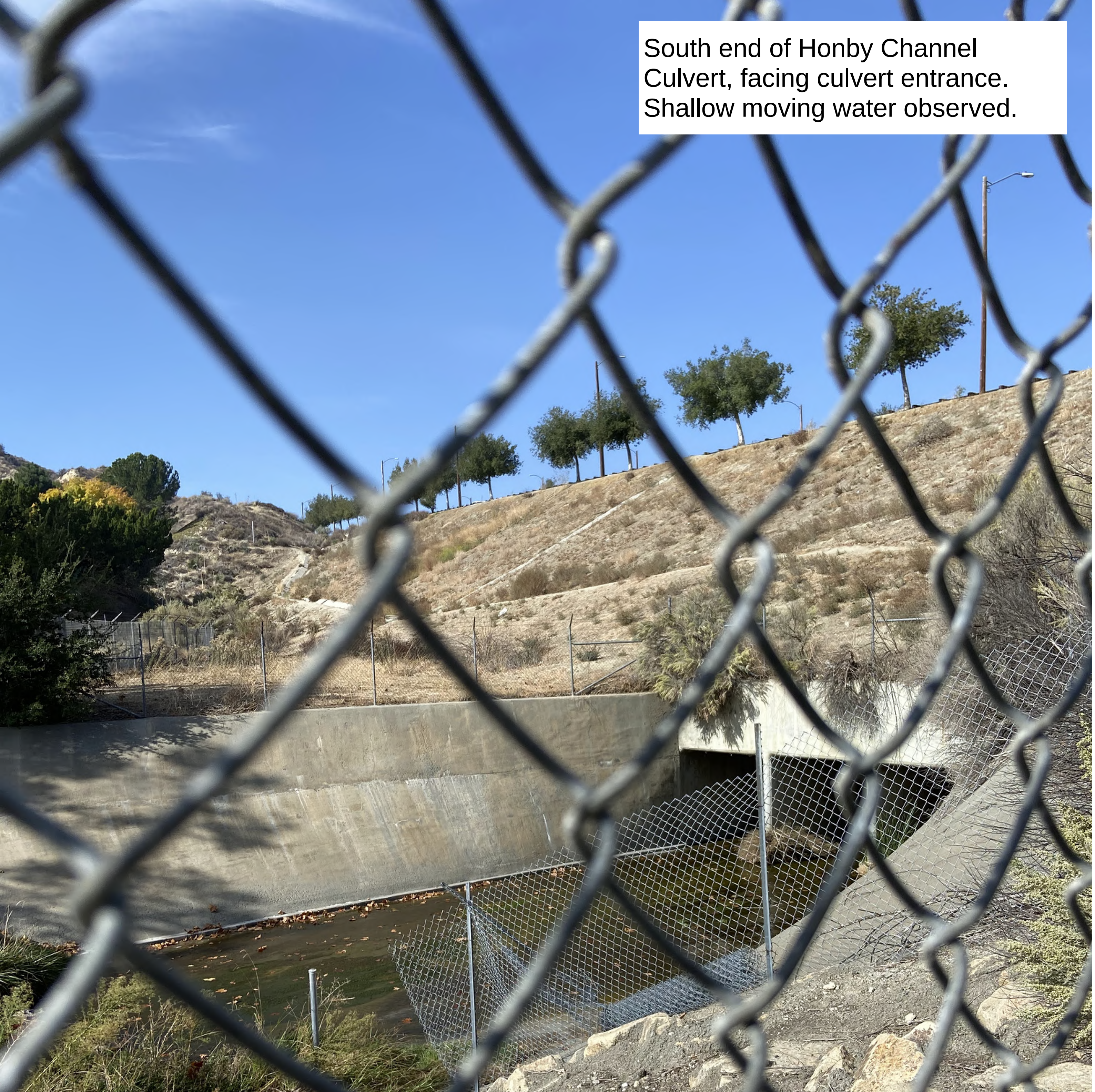
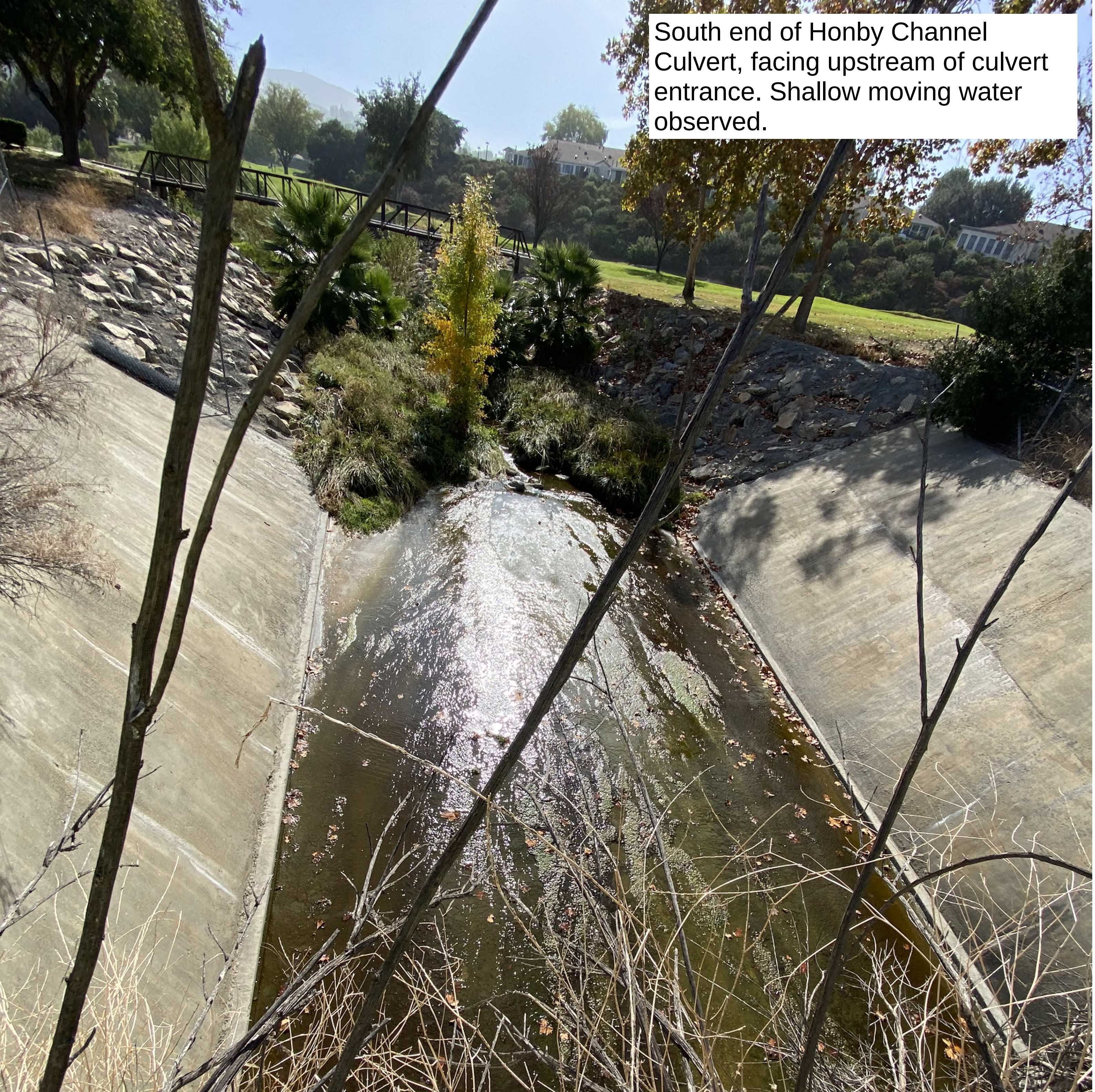
North end of Honby Channel Culvert, looking down on standing water

North end of Honby Channel Culvert, looking down on standing water

North end of Honby Channel Culvert, looking down on standing water



South end of Honby Channel Culvert, facing culvert entrance. Shallow moving water observed.



South end of Honby Channel Culvert, facing upstream of culvert entrance. Shallow moving water observed.

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Honby Channel Field Photos
Jan 2022

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North face of Honby Channel Culvert, facing south.

Depth of stagnant water measured at southern end of Honby Channel Culvert.

Stagnant water in Honby Channel Culvert, taken from the northern end of the culvert, facing south.

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Honby Channel Field Photos
Feb 2022

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North end of Honby Channel Culvert, facing north.

North end of Honby Channel Culvert, facing south.


North end of Honby Channel Culvert, facing north.

North end of Honby Channel Culvert, facing south.

Honby Channel Field Photos
Mar 2022

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North of Honby Channel
Culvert, facing south

North of Honby Channel Culvert, facing south

North of Honby Channel
Culvert, facing south

North of Honby Channel
Culvert, facing south

North of Honby Channel
Culvert, facing north

ATTACHMENT M – TMDLS IN THE SANTA CLARA RIVER WATERSHED MANAGEMENT AREA

I. SANTA CLARA RIVER NITROGEN COMPOUNDS TMDL

A. Permittees subject to the provisions below are identified in Attachment J, Tables J-3 and J-4.

B. Permittees shall comply with the following water quality-based effluent limitations for discharges to Santa Clara River Reach 5 and Reach 3[1] as of the effective date of the Order:

Constituent	Effluent Limitations (mg/L)			
	Reach 5		Reach 3	
	30-day average	1-hour average	30-day average	1-hour average
Total Ammonia as Nitrogen (NH_3-N)	1.75	5.2	2.0	4.2
Nitrate plus Nitrite as Nitrogen (NO_2-N + NO_3-N)	6.8	-	8.1	-

II. TMDL FOR CHLORIDE IN THE SANTA CLARA RIVER, REACH 3

A. Permittees subject to the provisions below are identified in Attachment J, Tables J-3 and J-4.

B. Permittees shall comply with the following water quality-based effluent limitation for discharges to Santa Clara River Reach 3 and its tributaries as of the effective date of the Order:

Constituent	Effluent Limitation Daily Maximum (mg/L)
Chloride	100

III. UPPER SANTA CLARA RIVER CHLORIDE TMDL

A. Permittees subject to the provisions below are identified in Attachment J, Tables J-3 and J-4.

B. Permittees shall comply with the following water quality-based effluent limitation for discharges to Santa Clara River Reaches 4B, 5, and 6 as of the effective date of the Order:

Constituent	Effluent Limitation Daily Maximum (mg/L)
Chloride	100

IV. SANTA CLARA RIVER ESTUARY AND REACHES 3, 5, 6, AND 7 INDICATOR BACTERIA TMDL

A. Permittees subject to the provisions below are identified in Attachment J, Tables J-3 and J-4.

B. The daily maximum single sample objectives for Santa Clara River Estuary, and Santa Clara River Reaches 1, 2, 3, and above are listed below:

[1] The Basin Plan Chapter 7-9 Santa Clara River Nitrogen Compounds TMDL uses the U.S. EPA Santa Clara River reach designations. Reach designations here are per the corresponding reach designations in the Los Angeles Region's Basin Plan Chapter 2. The U.S. EPA's Santa Clara River Reach 7 corresponds to Santa Clara River Reach 5 (Blue Cut Gauging Station to West Pier Highway 99) in the Los Angeles Region's Basin Plan Chapter 2. Likewise, U.S. EPA's Santa Clara River Reach 3 corresponds to part of Santa Clara River Reach 3 (between Freeman Diversion Dam near Saticoy to Timber Canyon above Santa Paula Creek) in the Los Angeles Region's Basin Plan Chapter 2.

Constituent	Daily Maximum Single Sample Objectives (MPN or cfu)	
	Santa Clara River Estuary and Santa Clara River Reaches 1 and 2	Santa Clara River Reaches 3 and above
E. coli	--	235/100 mL
Total coliform	10,000/100 mL[2]	--
Fecal coliform	400/100 mL	--
Enterococcus	104/100 mL	--

C. Permittees shall comply with the following interim receiving water limitations and water quality-based effluent limitations[3] for discharges to the Santa Clara River Estuary and Santa Clara River Reaches 1, 2, 3, and above as of the effective date of the Order[4]:

Location	Time Period	Interim Annual Allowable Exceedance Days of the Single Sample Objectives[5]		
		Daily Sampling	Weekly Sampling	3 Wet and 2 Dry weather events
Santa Clara River Estuary and Santa Clara River Reaches 1 and 2	Winter Dry Weather (November 1 to March 31)	49	7	1
	Summer Dry Weather (April 1 to October 31)	150	22	1
	Wet Weather (November 1 to October 31)	62	9	1
Santa Clara River Reaches 3 and above	Dry Weather (November 1 to October 31)	17	3	1
	Wet Weather (November 1 to October 31)	61	9	1

D. Permittees shall comply with the following final receiving water limitations and water quality-based effluent limitations[6] for discharges to the Santa Clara River Estuary and Santa Clara River Reaches 1, 2, 3, and above during dry weather no later than March 21, 2023, and during wet weather no later than March 21, 2029:

Location	Time Period	Final Annual Allowable Exceedance Days of the Single Sample Objectives[7]	
		Daily Sampling	Weekly Sampling
Santa Clara River Estuary and Santa Clara River Reaches 1 and 2	Winter Dry Weather (November 1 to March 31)	12	2
	Summer Dry Weather (April 1 to October 31)	10	2
	Wet Weather	25	4

2 Total coliform density shall not exceed the daily maximum of 1,000/100 mL, if the ratio of fecal-to-total coliform exceeds 0.1.
3 The receiving water limitations are group-based and shared among all MS4 Permittees in the Order located within the sub-drainage area to each reach.
4 Wet weather is defined as a day with 0.1 inch of rain or greater and the three days following the rain event. Dry weather is defined as a non-wet day.
5 The Single Sample Objectives are equivalent to the daily maximum values listed in subpart B above.
6 The receiving water limitations are group-based and shared among all MS4 Permittees in the Order located within the sub-drainage area to each reach.
7 The Single Sample Objectives are equivalent to the daily maximum values listed in subpart B above.

Location	Time Period	Final Annual Allowable Exceedance Days of the Single Sample Objectives[7]	
		Daily Sampling	Weekly Sampling
	(November 1 to October 31)		
Santa Clara River Reaches 3 and above	Dry Weather (November 1 to October 31)	5	1
	Wet Weather (November 1 to October 31)	16	3

E. Permittees shall comply with the following receiving water limitations and water quality-based effluent limitations for discharges to the Santa Clara River Estuary and Santa Clara River Reaches 1, 2, 3, and above no later than March 21, 2029:

Constituent	Rolling 30-day Geometric Mean (MPN or cfu)[8]	
	Santa Clara River Estuary and Santa Clara River Reaches 1 and 2	Santa Clara River Reaches 3 and above
E. coli	---	126/100 mL
Total coliform	1,000/100mL	---
Fecal coliform	200/100mL	---
Enterococcus	35/100mL	---

F. Permittees may propose wet-weather load-based compliance at MS4 outfalls. The plan shall include the following:

1. An estimate of existing load and the allowable load from MS4 outfalls to attain the allowable number of exceedance days in-stream; and

2. Technically defensible quantitative linkage to the allowable number of exceedance days; and

3. Quantitative estimates of the water quality benefits provided by the proposed implementation approach.

V. LAKE ELIZABETH, MUNZ LAKE, AND LAKE HUGHES TRASH TMDL (LAKE ELIZABETH ONLY)

A. Permittees subject to the provisions below are identified in Attachment J, Tables J-3 and J-4.

B. Permittees shall comply with water quality-based effluent limitations for trash per the provisions in Part IV.B.3 of the Order.

C. Permittees shall comply with the water quality-based effluent limitation of zero trash discharged to Lake Elizabeth and its shoreline as of the effective date of the Order and every water year thereafter.

VI. SANTA CLARA RIVER LAKES NUTRIENTS TMDL (LAKE ELIZABETH ONLY)

A. Permittees subject to the provisions below are identified in Attachment J, Tables J-3 and J-4.

[8] Geometric mean values shall be calculated on each sample day based on a statistically sufficient number of samples (generally not less than 5 samples equally spaced over a 30-day period) consistent with the REC-1 bacteria objectives.

B. Permittees[9] shall comply with the following mass-based water quality-based effluent limitations[10] for discharges of total nitrogen and total phosphorus to Lake Elizabeth no later than June 27, 2032:

Effluent Limitations	
Total Phosphorus (lb/yr)	**Total Nitrogen[11] (lb/yr)**
436.7	2536.8

C. Compliance with subpart B above shall be determined based on monitoring at all outfalls directly discharging to Lake Elizabeth at a minimum of quarterly per year. Permittees shall report flow of discharge from the outfall in conjunction with reporting monitoring data.

[9] Responsible Permittees include County of Los Angeles and LACFCD.
[10] The water quality-based effluent limitations are group-based and shared among all MS4 Permittees in the Order located within the sub-drainage area to Lake Elizabeth.
[11] Total Nitrogen is the sum of TKN plus Nitrate-N plus Nitrite-N.

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June 2021

2020 Urban Water Management Plan for

Santa Clarita Valley Water Agency

(Los Angeles County Waterworks District No. 36/Cooperating Agency)

VOLUME 1 FINAL

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Santa Clarita Valley Water Agency 2020 Urban Water Management Plan FINAL

28 June 2021

Prepared for

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KJ Project No. 2044228*00

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Section 1: Introduction, Plan Preparation, Plan Adoption and Lay Description

1.1 Overview

This document comprises the Urban Water Management Plan 2020 (UWMP or Plan) for the Santa Clarita Valley Water Agency (SCV Water) service area. The 2015 UWMP was prepared for the Castaic Lake Water Agency (CLWA) service area which, at the time, included four retail water purveyors: the Santa Clarita Water Division (SCWD), a division of CLWA, Newhall County Water District (NCWD), Valencia Water Company (VWC) and Los Angeles County Waterworks District 36 (LACWWD 36).

On January 1, 2018, pursuant to state legislation (SB 634, Chapter 833 2017), CLWA and NCWD, merged together to become a new special act entity called SCV Water. Later in January 2018, VWC was dissolved and its assets were transferred to SCV Water. At present, SCV Water is made up of three water divisions: Newhall Water Division (NWD), Santa Clarita Water Division (SCWD) and Valencia Water Division (VWD). SCV Water also continues to serve LACWWD 36. This Plan was developed as an individual UWMP for the SCV Water service area. This section describes the general purpose of the Plan, discusses Plan implementation and provides general information about SCV Water and service area characteristics.

1.2 Purpose

An Urban Water Management Plan (UWMP) is a planning tool that generally guides the actions of urban water suppliers. It provides managers and the public with a broad perspective on a number of water supply issues. It is not a substitute for project-specific planning documents, nor was it intended to be when mandated by the State Legislature. For example, the Legislature mandated that a plan include a section which "…describes the opportunities for exchanges or water transfers on a short-term or long-term basis." (Wat. Code, § 10631, subd. (d)). The identification of such opportunities and the inclusion of those opportunities in a plan's general water service reliability analysis neither commits an urban water supplier to pursue a particular water exchange/transfer opportunity, nor precludes it from exploring exchange/transfer opportunities not identified in its plan. Before an urban water supplier is able to implement any potential future sources of water supply, detailed project plans are prepared and approved, financial and operational plans are developed and required environmental analysis is completed.

"A plan is intended to function as a planning tool to guide broad-perspective decision making by the management of water suppliers." (*Sonoma County Water Coalition v. Sonoma County Water Agency* (2010) 189 Cal. App. 4th 33, 39.) It should not be viewed as an exact blueprint for supply and demand management. Water management in California is not a matter of certainty and planning projections may change in response to a number of factors. "[L]ong-term water planning involves expectations and not certainties. The California Supreme Court has recognized the uncertainties inherent in long-term land use and water planning and observed that the generalized information required in the early stages of the planning process are replaced by firm assurances of water supplies at later stages." (*Id.*, at 41.) From this perspective, it is appropriate to look at the UWMP as a general planning framework, not a specific action plan. It is an effort to generally answer a series of planning questions such as:

- What are the potential sources of supply and what amounts are estimated to be available from them?
- What is the projected demand, given a reasonable set of assumptions about growth and implementation of good water management practices?
- How do the projected supply and demand figures compare and relate to each other?

Using these "framework" questions and resulting answers, SCV Water will pursue feasible and cost-effective options and opportunities to develop supplies and meet demands.

As further detailed in this Plan, SCV Water will continue to explore enhancing and managing supplies from existing sources such as the State Water Project (SWP) as well as other options. These include groundwater extraction, water exchanges and transfers, water conservation, water recycling, brackish water desalination, and water banking/conjunctive use. Additional specific planning efforts may be undertaken in regard to each option, involving detailed evaluations of how each option would fit into the overall supply/demand framework, potential environmental impacts, and how each option would affect customers.

The California Urban Water Management Planning Act (Act) requires preparation of a plan that, among other things:

- Accomplishes water supply planning over a 20-year period in five-year increments. (SCV Water is exceeding the requirements of the Act by developing a plan which spans thirty years.)
- Identifies and quantifies existing and projected water supplies and water supply opportunities, including recycled water, for existing and future demands, in normal, single-dry and multiple-dry years.
- Implements conservation and efficient use of urban water supplies.

Additionally, Senate Bill 7 of Special Extended Session 7 (SBx7-7) was signed into law in November 2009, which called for a 20 percent reduction in per capita water use statewide by 2020. SBx7-7, otherwise referred to as the Water Conservation Act of 2009, requires each urban retail water supplier to develop an urban water use target to help the state collectively achieve the 20 percent reduction. Beginning in 2016, retail water suppliers were required to comply with the water conservation requirements in SBx7-7 in order to be eligible for State water grants or loans. In compliance with the legislation, this Plan describes the methodology used to calculate SCV Water's baseline water use and an updated 2020 water use target. In addition, this Plan demonstrates that SCV Water complied with its target reduction by December 31, 2020.

A number of changes to the California Water Code (CWC) have been enacted since 2015 which apply to the preparation of the 2020 Plan updates. Major changes include:

- UWMP Submittal Date, CWC Section 10621(f)

- Five consecutive dry-year water reliability assessment
- Quantify Distribution System Water Loss, CWC Section 10631(d)(3)(A)(C)
- Consistency with Groundwater Sustainability Plans, CWC Section 10631(b)(4)(A)
- Seismic Risk Assessment and Mitigation Plan, CWC Section 10632.5(a)
- Energy Use Information, CEC 10631.2(a)
- Drought Risk Assessment, CWC Section 10635
- Additional Water Shortage Contingency Plan requirements, CWC Section 10632

A checklist to ensure compliance of this Plan with the Act requirements is provided in Appendix B.

It is the stated goal of SCV Water to deliver a reliable and high-quality water supply to its customers, even during dry periods. Based on conservative water supply and demand assumptions over the next thirty years during normal and dry water years, the 2020 UWMP shows how SCV Water will successfully achieve this goal over the planning horizon.

1.2.1 Relationship to Water Shortage Contingency Plan

Concurrent with the 2020 UWMP update, SCV Water also updated its Water Shortage Contingency Plan (WSCP) consistent with CWC Section 10632 and Section 10635. The CWC requires that the WSCP be prepared and submitted with the UWMP. The WSCP outlines SCV Water's action plan for a drought or a water supply shortage and specifies opportunities to reduce demand and augment supplies under such conditions. The WSCP was adopted as a stand-alone document and is referenced in this Plan and is included as an attachment in Appendix J. Section 9 of the Plan provides additional detail as to how SCV Water has planned to respond to various potential catastrophic interruptions as well as regional power outages.

1.3 Basis for Preparing a Plan

In accordance with the CWC, urban water suppliers providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water per year (AFY), are required to prepare an UWMP every five years. The 2020 UWMP must be adopted by SCV Water's Board of Directors and submitted to DWR by July 1, 2021.

1.4 Implementation of the Plan

SCV Water has a long-term contract with the State of California, through DWR, to acquire and distribute SWP Water to its customers, including LACWWD 36. This Plan is required for SCV Water. LACWWD 36, is not required to prepare an UWMP because they do not provide water to more than 3,000 customers or supply more than 3,000 acre-feet (AF) of water annually; however, LACWWD 36 participated in the development of the Plan on a cooperating basis. This subsection provides an overview of the framework within which the Plan has been prepared, including agency coordination, public outreach and resource maximization.

Section 4: Water Resources

4.1 Overview

This section describes the water resources available to SCV Water through 2050, the next thirty (30) years. SCV Water's existing water resources include imported supplies, local groundwater, recycled water (discussed further in Section 5) and water from existing groundwater banking programs. Planned supplies include new groundwater production as well as additional banking programs. Table 4-1 summarizes actual water supplies used in 2020, by supply source. It is important to note that 2020 was a dry year, resulting in use of banking and exchange program supplies to make up for reduced availability of select imported supplies. Additionally, 2020 supply utilization reflects temporary groundwater pumping conditions resulting from water quality impacts on groundwater supplies. Supplies used in 2020 are not indicative of available future water supplies. Existing and planned supplies are described in this Section, and supply reliability analyses under various hydrologic conditions are presented in Section 7.

TABLE 4-1 SUMMARY OF WATER SUPPLIES USED IN 2020 (AF)
[DWR TABLE 6-8]

	2020[(a)]
Existing Groundwater	
Alluvial Aquifer	7,571
Saugus Formation	9,761
Total Groundwater[(b)]	**17,332**
Recycled Water	
Total Recycled	**468**
Imported Water	
State Water Project	14,587
Buena Vista-Rosedale	11,000
Yuba Accord Water	284
Total Imported	**25,871**
Existing Banking and Exchange Programs[(c)]	
Rosedale Rio-Bravo Bank	1,600
Semitropic Bank	5,000
Rosedale Rio-Bravo Exchange	14,451
Antelope Valley East Kern Water Agency Exchange	1,406
West Kern Exchange	500
Total Bank/Exchange	**22,957**
Total Water Usage	**66,630**

Notes:
(a) Actual 2020 supplies utilized. These values are not indicative of available future supplies. The projected availability of future supplies under various hydrologic conditions is detailed in Section 7.
(b) Reflects temporary greater pumping of Saugus Formation to mitigate for lost Alluvial Aquifer pumping pending installation of PFAS treatment described in Tables 4-7A, 4-8A, and in Tables 4-7B, 4-7C, 4-8B and 4-8C in Appendix E. Additional details on water quality impacts to groundwater supply availability provided in Section 4.3 and Section 6.
(c) Banking and exchange programs used to firm supplies due to dry SWP conditions and reduced access to local groundwater caused by PFAS and perchlorate impacts. Banking and exchange programs not used do not reflect a normal year long term water supply.

Year	SWP Deliveries to SCV Water Service Area[(a)]	SWP Deliveries to Out-of-Service Area Storage/ Exchange[(b)]	Withdrawals from Out-of-Service Area Storage/ Exchange[(b)]	Other Imported Deliveries to SCV Water Service Area[(c)(d)]	Other Imported Deliveries to Out of-Service Area Storage/ Exchange[(d)]	Total Imported Supplies to SCV Water Service Area
2005	36,747	20,000	-	-	-	36,747
2006	39,622	20,395	-	-	-	39,622
2007	34,919	8,200	-	11,000	-	45,919
2008	31,878	-	-	11,000	-	42,878
2009	26,096	-	1,650	11,000	-	38,746
2010	16,988	33,024	3,300	11,000	-	31,288
2011	20,445	23,796	-	11,000	-	31,445
2012	36,153	18,569	-	0	11,000	36,153
2013	33,126	28,628	-	11,000	-	44,126
2014	8,673	-	14,198	11,000	-	33,871
2015	15,196	4,339	2,998	10,995	-	29,189
2016	31,888			-	6,560	31,888
2017	47,912	5,795			11,000	47,912
2018	36,835	62		6,000		42,897
2019	41,111	24884	750	1,100		42,961
2020	14,871		22,957	11,000		48,828

Sources: DWR Bulletin 132, Management of the California State Water Project; and DWR delivery files.
Notes:
(a) Includes deliveries of Table A supplies, carryover water, Article 21 water, Turnback Pool water, local supply (from West Branch reservoirs), Yuba Accord water and water purchased through DWR.
(b) Out-of-service area storage includes flexible storage in Castaic Lake, the Semitropic Banking Program and the Rosedale-Rio Bravo Banking Program and deliveries to Devil's Den, and exchange includes the Rosedale-Rio Bravo Exchange and West Kern Exchange.
(c) Deliveries from Buena Vista.
(d) Years when other imported deliveries to SCV Water service area, and other imported deliveries to out of service area storage/exchange do not total 11,000 AF, are due to water sales that occurred and are not shown in this table.

4.3 Groundwater

This section presents information about the purveyors' groundwater supplies, including a summary of the adopted groundwater management plan (GWMP) and Groundwater Sustainability Plan (GSP) activities. The passage of the Sustainable Groundwater Management Act (SGMA) in 2014 replaces the GWMP with a requirement that a GSP be prepared by 2022 in those basins the DWR has identified as medium to high priority.

4.3.1 Santa Clara River Groundwater Basin – East Subbasin

The sole source of local groundwater for urban water supply in the Valley is the groundwater Basin identified in the DWR Bulletin 118 (DWR 2016) as the Santa Clara River Valley Groundwater Basin, East Subbasin (Basin) (Basin No. 4-4.07). The Basin is comprised of two aquifer systems, the Alluvium and the Saugus Formation. The Alluvium generally underlies the Santa Clara River and adjacent areas, including its several tributaries, to maximum depths of about 200 feet; and the Saugus Formation underlies practically the entire Upper Santa Clara River area, to depths of at least 2,000 feet. There are also some scattered outcrops of Terrace deposits in the Basin that likely contain limited amounts of groundwater. However, since these deposits are located in limited areas situated at elevations above the regional water table and are also of limited thickness, they are of no practical significance as aquifers for municipal water supply; consequently, they have not been developed for any significant water supply in the Basin and are not included as part of the existing or planned groundwater supplies described in this UWMP. Figure 3-1 illustrates the extent of the Santa Clara River Valley East Subbasin in DWR Bulletin 118 (DWR 2016). The Basin is defined in Bulletin 118 as being bordered on the north by the Piru Mountains, on the west by impervious rocks of the Modelo and Saugus Formations and a constriction in the alluvium, on the south by the Santa Susana Mountains, and on the south and east by the San Gabriel Mountains (DWR 2016). The extent of the basin generally coincides with the outer extent of the Alluvium and Saugus Formation. The SCV Water service area is also shown on Figure 3-1.

The Santa Clara River Valley Groundwater Basin, East Subbasin has been identified by DWR as a high priority basin (DWR 2019), thereby requiring preparation of a GSP, described below.

4.3.2 Groundwater Management Planning

As part of legislation authorizing SCV Water to provide retail water service to individual municipal customers, Assembly Bill (AB) 134 (2001) included a requirement that SCV Water prepare a GWMP (provided as Appendix I) in accordance with the provisions of Water Code Section 10753, which was originally enacted by AB 3030. This legislation has since been superseded by the passage of SGMA in 2014, however, the existing GWMP will be in effect until a GSP is submitted to DWR in 2022. A summary of ongoing GSP activities as well as a summary of the GWMP are provided below.

4.3.2.1 Groundwater Sustainability Plan

The Santa Clarita Valley Groundwater Sustainability Agency (SCV-GSA) operates under a Joint Powers Agreement which was executed by member Agencies in 2018. The SCV-GSA is currently developing the State-required GSP for the East Subbasin of the Santa Clara River Valley Groundwater Basin. Developing the plan is a significant multi-year undertaking and plan adoption is anticipated by December 2021. Stakeholder engagement continues to be an important component of plan development and a Stakeholder Advisory Committee is in place to reflect views from private well owners, members at large, environmental interests, and the business community. This Stakeholder Advisory Committee meets regularly to review technical memoranda and provide advisement to the GSA on materials and assistance with a number of public workshops.

The final Board Adopted GSP is anticipated to be consistent with the current groundwater operating plan as described in the Groundwater Management Plan (AB 3030 plan), and the 2009 update, described below. The GSP is based on a new groundwater flow model (an unstructured grid version of ModFlow called ModFlow USG) that models the groundwater operating plan but reflects some updates such as redistribution of pumping and current Basin conditions. Once completed, the SCV-GSA will conduct required annual monitoring and reporting for the GSP making that available to the State and stakeholders.

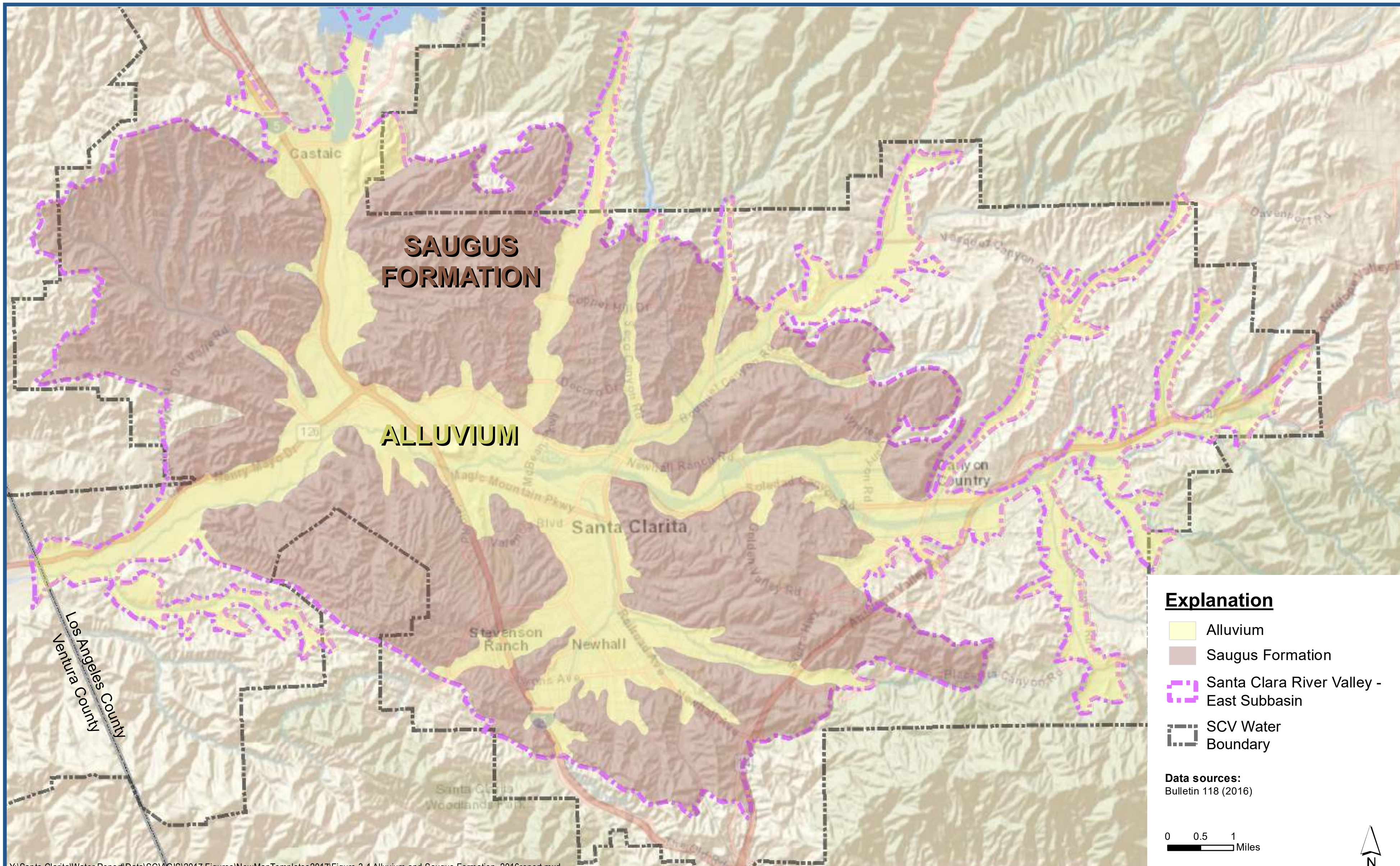
4.3.2.2 Groundwater Management Plan

The general contents of the GWMP were outlined in 2002, and a detailed plan was adopted in 2003 to satisfy the requirements of AB 134. The plan both complements and formalizes a number of existing water supply and water resource planning and management activities in SCV Water's service area, which effectively encompass the East Subbasin of the Santa Clara River

Valley Groundwater Basin. Notably, the GWMP also includes a basin-wide monitoring program, the results of which provide input to annual reporting on water supplies and water resources in the Basin, as well as input to assessment of Basin yield for water supply as described herein. Groundwater level data from the existing groundwater monitoring program is reported to DWR as part of SBX7-6 implementation (California Statewide Groundwater Elevation Monitoring [CASGEM]). SCV Water serves as the monitoring entity for CASGEM for the basin. Available groundwater level data for the CASGEM program is submitted twice a year. SCV Water will continue to provide groundwater level data consistent with the CASGEM program.

The GWMP contains four management objectives, or goals, for the Basin including (1) development of an integrated surface water, groundwater and recycled water supply to meet existing and projected demands for municipal, agricultural and other water uses; (2) assessment of groundwater basin conditions to determine a range of operational yield values that use local groundwater conjunctively with supplemental SWP supplies and recycled water to avoid groundwater overdraft; (3) preservation of groundwater quality, including active characterization and resolution of any groundwater contamination problems and (4) preservation of interrelated surface water resources, which includes managing groundwater to not adversely impact surface and groundwater discharges or quality to downstream basin(s).

Prior to preparation and adoption of the GWMP, a local Memorandum of Understanding (MOU) process among the former CLWA, the CLWA retail water purveyors and United Water Conservation District (UWCD) in neighboring Ventura County, downstream of the East Subbasin of the Santa Clara River Valley, produced the beginning of local groundwater management. This is now embodied in the GWMP prepared and implemented in 2001. The MOU was a collaborative and integrated approach to several aspects of water resource management included in the GWMP. As a result of the MOU, the cooperating agencies integrated their respective database management efforts and continued to monitor and report on the status of Basin conditions, as well as on geologic and hydrologic aspects of their respective parts of the overall stream-aquifer system. Following adoption of the GWMP, the water suppliers developed and utilized a numerical groundwater flow model for analysis of groundwater basin yield and for analysis of extraction and containment of groundwater contamination. The results of those basin yield and contamination analyses, most recently updated in 2009 by Luhdorff and Scalmanini Consulting Engineers and GSI Water Solutions, Inc. (LSCE & GSI, 2009), are bases for the amounts and allocations of groundwater supplies in this UWMP.



Luhdorff & Scalmanini
Consulting Engineers

Alluvium and Saugus Formation

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 4-1

The adopted GWMP includes 14 elements intended to accomplish the Basin management objectives listed above. In summary, the plan elements include:

- Monitoring of groundwater levels, quality, production and subsidence
- Monitoring and management of surface water flows and quality
- Determination of Basin yield and avoidance of overdraft
- Development of regular and dry-year emergency water supply
- Continuation of conjunctive use operations
- Long-term salinity management
- Integration of recycled water
- Identification and mitigation of soil and groundwater contamination, including involvement with other local agencies in investigation, cleanup and closure
- Development and continuation of local, state and federal agency relationships
- Groundwater management reports
- Continuation of public education and water conservation programs
- Identification and management of recharge areas and wellhead protection areas
- Identification of well construction, abandonment and destruction policies
- Provisions to update the groundwater management plan

Work on a number of the GWMP elements had been ongoing for some time prior to the formal adoption of the GWMP, and expanded work on implementation of the GWMP will continue on an ongoing basis. Draft elements of the GSP evaluate the operating plan going forward and these analyses of the groundwater basin are reflected in this Plan. Notable in the implementation of the GWMP has been the annual preparation of a Santa Clarita Valley Water Report (Annual Report) that summarizes (1) water requirements, (2) all three sources of water supply (groundwater, imported surface water and recycled water, all as part of the GWMP's overall management objectives) and (3) projected water supply availability to meet the following year's projected water requirements. Besides for addressing GWMP requirements, the Annual Report is also prepared in response to a request by the Los Angeles County Board of Supervisors and the MOU between the water purveyors in the Basin and UWCD.

4.3.2.3 Available Groundwater Supplies

The groundwater component of overall water supply in the Valley derives from a groundwater operating plan developed and analyzed to meet water requirements (municipal, agricultural, small domestic) while maintaining the Basin in a sustainable condition, specifically no long-term depletion of groundwater or interrelated surface water. The operating plan also addresses groundwater contamination issues in the Basin, all consistent with the GWMP described above. The groundwater operating plan is based on the concept that pumping can vary from year to year to allow increased groundwater use in dry periods and increased recharge during wet periods to collectively assure that the groundwater Basin is adequately replenished through various wet/dry cycles. As ultimately formalized in the GWMP and described in the Basin Yield Report (LSCE and GSI, 2009), the operating yield concept has been quantified as ranges of annual pumping volumes to capture year-to-year pumping fluctuations in response to both hydrologic conditions and customer demand.

Ongoing work through implementation of the GWMP has produced three detailed technical reports in addition to the annual Water Reports (the most recent of which, for 2019, was the twenty-second annual report). The first detailed technical report (CH2M Hill, April 2004) documents the construction and calibration of the groundwater flow model for the Valley. The second report (CH2M Hill and LSCE, August 2005) presents the initial modeling analysis of the purveyors' original groundwater operating plan. The most recent report, an updated analysis of the Basin (LSCE & GSI, 2009) presents the modeling analysis of the current groundwater operating plan, including restoration of two Saugus Formation wells for municipal supply after treatment and also presents a range of potential impacts deriving from climate change considerations. All those results are reflected in this UWMP. The primary conclusion of the technical analysis is that the groundwater operating plan will not cause detrimental short or long term effects to the groundwater and surface water resources in the Valley and is therefore sustainable. The analysis of sustainability for groundwater and interrelated surface water is described in detail in "Analysis of Groundwater Supplies and Groundwater Basin Yield, Upper Santa Clara River Groundwater Basin, East Subbasin" (Basin Yield Analysis) prepared August 2009 (LSCE & GSI, 2009).

Additional technical work performed for the SCV-GSA in preparation its Groundwater Sustainability Plan (GSP), confirmed previous conclusions that the basin plan was sustainable. Utilizing the new MODFLOW-USG model additional analysis of the basin plan operating plan was performed for the Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin report, GSI Water Solutions Inc, October 2021. The analysis was based on the existing operating plan, modified spatial pumping distribution, incorporated updated climate change data, and made other refinements. The analysis concluded that chronic lowering of groundwater levels and groundwater storage would not occur under the operating plan and therefore operation was within the safe yield of the Basin.

The updated groundwater operating plan (LSCE & GSI, 2009), summarized in Table 4-4, is as follows:

- **Alluvium:** Pumping from the Alluvial Aquifer in a given year is governed by local hydrologic conditions in the eastern Santa Clara River Watershed. Pumping for municipal, agricultural, and private purposes ranges between 30,000 and 40,000 AFY during normal and above-normal rainfall years. However, due to hydrogeologic constraints in the eastern part of the Basin along with distribution of groundwater pumping, pumping is reduced to between 30,000 and 35,000 AFY during locally dry years. These amounts result in an ability to operate supply wells in the Basin in a feasible and sustainable manner.

- **Saugus Formation:** Pumping from the Saugus Formation in a given year is tied directly to the availability of other water supplies, particularly from the SWP. During average-year conditions within the SWP system, Saugus pumping ranges between 7,500 and 15,000 AFY. Planned dry-year pumping from the Saugus Formation ranges between 15,000 and 25,000 AFY during a drought year and can increase to between 21,000 and 25,000 AFY if SWP deliveries are reduced for two consecutive years and between 21,000 and 35,000 AFY if SWP deliveries are reduced for three consecutive years. Such high pumping would be followed by periods of reduced (average-year) pumping, at rates between 7,500 and 15,000 AFY, to further enhance the effectiveness of natural recharge processes that would recover water levels and groundwater storage volumes after the higher pumping during years with low SWP allocations.

TABLE 4-4 GROUNDWATER OPERATING PLAN FOR THE SANTA CLARITA VALLEY

	Groundwater Production (AF)			
Aquifer	**Normal Years**	**Dry Year 1**	**Dry Year 2**	**Dry Years 3-5**
Alluvium	30,000 to 40,000	30,000 to 35,000	30,000 to 35,000	30,000 to 35,000
Saugus Formation	7,500 to 15,000	15,000 to 25,000	21,000 to 25,000	21,000 to 35,000
Total	**37,500 to 55,000**	**45,000 to 60,000**	**51,000 to 60,000**	**51,000 to 70,000**

Within the groundwater operating plan, three factors affect the availability of groundwater supplies: sufficient source capacity (wells and pumps), sustainability of the groundwater resource to meet pumping demand on a renewable basis and protection of groundwater sources (wells) from known contamination, or provisions for treatment in the event of contamination. These factors are discussed below.

Protection of groundwater sources and provisions for treatment in the event of contamination is briefly discussed below and discussed further in Section 6.

Perchlorate has been a water quality concern since 1997 when first detected in SCV Water's service area. Several Saugus Formation and Alluvial wells were initially removed from service. Treatment facilities for two wells, Saugus 1 and Saugus 2, have been installed and are currently operational. A treatment facility has been installed for the V201 well and awaits final permitting. Treatment system design has been initiated for Well 205. Additionally, two new wells, Saugus 3 and 4 have been designed and await permitting from DDW prior to drilling. Additional details on DDW permitting and associated timeline for Saugus wells are provided in Section 6.7.

Recently, USEPA provided a health advisory of lifetime exposure to PFOA and PFOS of 70 parts per trillion (or 70 nanogram per liter (ng/l)) for polyfluoroalkyl substances (PFAS). The health advisory is non-enforceable and non-regulatory and is intended to provide technical information to local and state agencies. In August of 2019, DDW set notification level (NL) and response levels for various PFAS constituents. SCV Water wells were tested and as of February 2020, over 60% of Alluvium wells exceeded the NL or RL resulting in 18 wells being taken out of service. Treatment for three of these wells (N-Wells) has been installed and the wells are now operational. Design is underway for treatment of two additional wells, Honby and Santa Clara, scheduled to be back online by 2023. Preliminary design for an additional 6 wells is under way and they are anticipated to be back online between 2024 and 2025. The remaining wells are anticipated to have treatment installed by 2030. Refer to the feasibility assessment and schedule for completion of these wells in Appendix M.

During this interim period of operation, pumping from non-impacted alluvium wells and Saugus Formation wells will be increased to partially mitigate for lost production capacity. The pumping distribution shown in Table 4-5 and Table 4-6 below were developed in coordination with the SCV Water Operation Division and reflect a likely operation moving forward but will be adjusted to reflect operational conditions that may develop.

Recent historical groundwater pumping by SCV Water and other groundwater users is summarized in Table 4-5. Planned future groundwater pumping in normal years, by the retail water purveyors as well as by other groundwater users, is summarized in Table 4-6. Existing and planned groundwater pumping by SCV Water as well as by other groundwater users, for normal, single-dry and multiple-dry year periods, are summarized in Section 4.3.3.4 and in Table 4-9 through Table 4-11 below.

TABLE 4-5 RECENT HISTORICAL GROUNDWATER PRODUCTION (AF)[(a)]

Santa Clara River Valley East Subbasin	2016	2017	2018	2019	2020
SCWD	6,892	3,900	5,383	5,948	5,311
Alluvium	3,485	907	2,465	2,762	2,517
Saugus Formation[(b)]	3,407	2,993	2,918	3,186	2,794
LACWWD 36	1,047	1,093	1,204	972	1,257
Alluvium	0	0	0	0	0
Saugus Formation	1,047	1,093	1,204	972	1,257
NCWD/NWD	4,468	2,303	2,608	3,708	4,591
Alluvium	626	780	728	1,044	1,322
Saugus Formation	3,842	1,523	1,880	2,664	3,269
VWC/VWD	13,922	9,107	13,674	6,919	6,173
Alluvium	11,133	7,737	10,837	5,243	3,732
Saugus Formation	2,789	1,370	2,837	1,676	2,441
Total Purveyor	**26,329**	**16,403**	**22,869**	**17,547**	**17,332**
Alluvium	**15,244**	**9,424**	**14,030**	**9,049**	**7,571**
Saugus Formation	**11,085**	**6,979**	**8,839**	**8,498**	**9,761**
Agricultural and Other[(c)(d)]	14,359	13,438	13,071	12,510	12,300
Alluvium	13,605	12,554	12,437	11,967	9,190
Saugus Formation	754	884	843	1067	1060
Total Basin	**40,688**	**29,841**	**36,149**	**30,581**	**27,582**
Alluvium	**28,849**	**21,978**	**26,467**	**21,016**	**16,761**
Saugus Formation	**11,839**	**7,863**	**9,682**	**9,565**	**10,821**
Groundwater Fraction of Total Municipal Water Supply	**56%**	**39%**	**46%**	**42%**	**36%**

Notes:
(a) From 2019 Santa Clarita Valley Water Report (July 2020) and recorded amounts for 2020.
(b) Represents pumping from Saugus 1 and Saugus 2 wells.
(c) Includes agricultural and other small private well pumping.
(d) 2020 Agricultural and Other alluvial production includes Pitches Detention Center = 1,282 AF, Sand Canyon Country Club 116 AF, Small Pumpers = 500 AF and 2020 Newhall Land and Farming pumping = 7,292 AF for a total of 9,190 AF. Saugus includes private irrigation pumping from Valencia Country Club and Vista Valencia Golf Course 612 AF Saugus and Whittaker Bermite Treatment = 448 AF, for a total of 1,060 AF.

As reflected in Table 4-6, the groundwater operating plan recognizes ongoing pumping for the two major uses of groundwater in the Basin, municipal and agricultural (including private pumpers) water supply. Consistent with the groundwater operating plan, projected groundwater pumping includes an ongoing conversion of pumping, coincident with planned land-use changes, from agricultural to municipal water supply. This is shown in Table 4-6, with projected pumping by agricultural and other users decreasing as purveyor pumping increases in such a manner that overall pumping remains within the basin operating plan. The reduction in pumping for agricultural supply is primarily due to the development of Newhall Ranch (expected buildout date of 2034) and is expected to shift to an increase in pumping by SCV Water. The groundwater operating plan and projected pumping also includes other small private domestic and related pumping. As shown in Table 4-6, total projected groundwater pumping by all users within each aquifer is within the ranges for normal year pumping identified in the groundwater operating plan (Table 4-4). SCV Water recognizes that these estimates of projected groundwater use are subject to adjustment based on various factors and conditions occurring from time to time. These estimates are provided for the planning purposes of this report and the UWMP, and do not constitute an allocation of groundwater from the local groundwater basins.

4.3.2.4 Alluvium

Based on a combination of historical operating experience and groundwater modeling analyses (2005 and 2009 groundwater operation plan updates), the Alluvial Aquifer can supply groundwater on a long-term sustainable basis in the overall range of 30,000 to 40,000 AFY, with a probable reduction in dry years to a range of 30,000 to 35,000 AFY. Both of those ranges include 13,000 to 6,400 AFY (as reflected in Table 4-9 and Table 4-10) of Alluvial pumping for agricultural and other non-municipal water uses. The dry year reduction is a result of practical constraints in the eastern part of the Basin, where lowered groundwater levels in dry periods have the effect of reducing pumping capacities in that shallower portion of the aquifer. The GSP will also consider potential impacts on Groundwater Dependent Ecosystems throughout the basin and available analysis supports a determination that historic pumping patterns and future pumping patterns consistent with the Groundwater Basin Operating Plan were protective of these systems. In addition, in general, increased water conservation practices are expected to reduce both indoor and outdoor irrigation demands. Less outdoor irrigation water use creates less return flow to the basin and less indoor water use creates less recycled water both for use within SCV Water and for return to the River. SCV Water will monitor these effects to ensure that pumping by SCV Water does not impact groundwater supply for other uses, including groundwater dependent ecology. Additionally, it is anticipated that the SCV-GSA will monitor groundwater conditions and implement management actions if Sustainable Management Criteria, or Groundwater Dependent Ecosystem triggers are reached so as to protect resources and ensure sustainable operation of the basin.

One notable change in the future geographic patterns of production compared to historical distributions concerns the historic distribution of agricultural pumping compared to future distribution among SCV Water wells. Under the Newhall Ranch Specific Plan, NLF is to dedicate up to 7,038 AFY by fallowing lands and reducing agricultural pumping on its lands. Under the Specific Plan, SCV Water would then have the ability to pump water to serve the new development. The project will be constructed in stages over a number of years depending on market conditions. Likewise, SCV Water pumping would increase over time in such a manner that the overall pumping remains within the basin operating plan. The Specific Plan development is projecting to implement water conservation practices which will reduce both indoor and outdoor irrigation demands. This reduces the overall water demand of the development. Consistent with the above, SCV Water will monitor the transfer of water from NLF to ensure it does not impact other uses

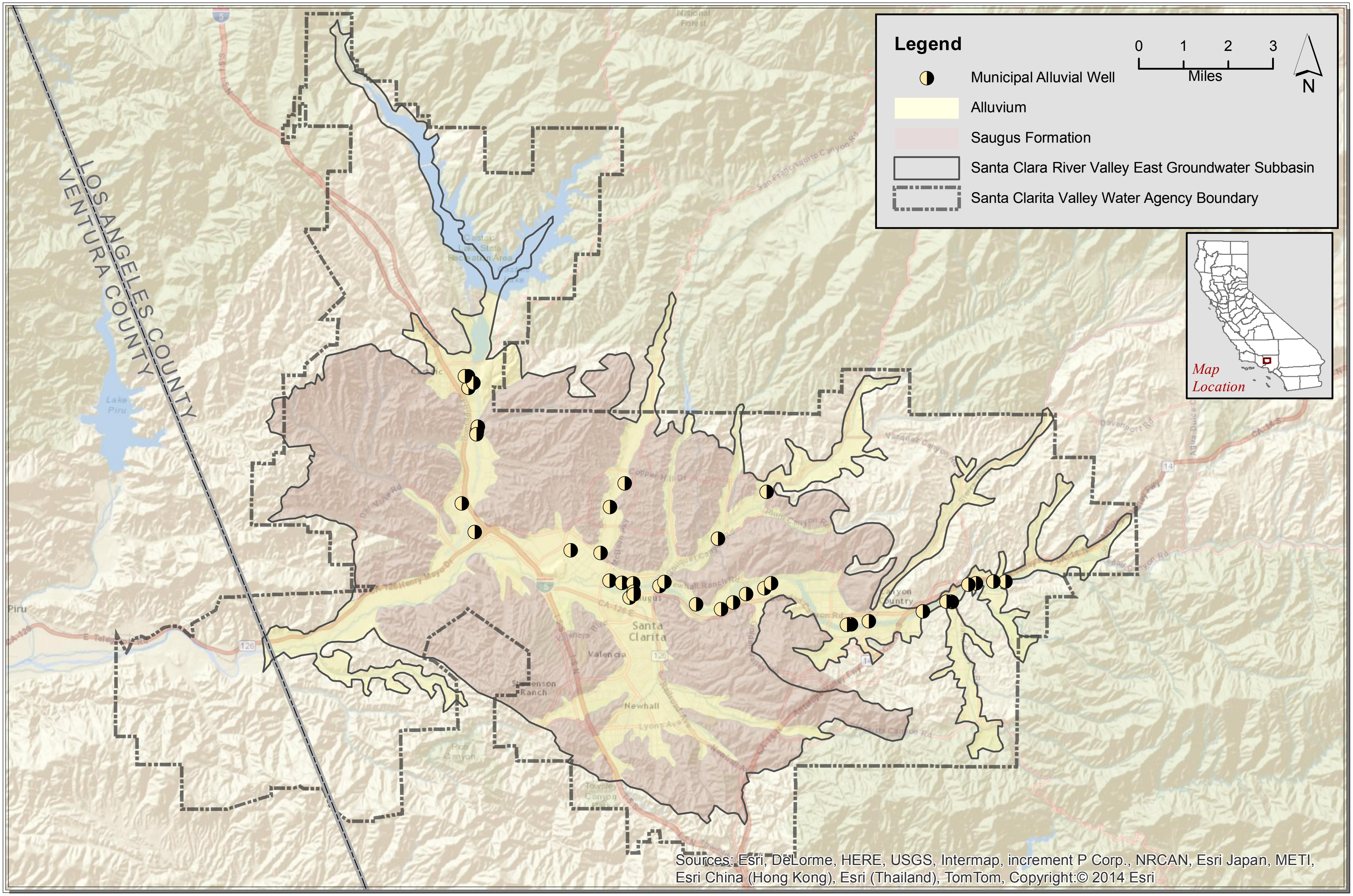
If the 7,038 AFY dedicated by NLF is not sufficient to support the Specific Plan Development, NLF (or its successor in interest), will transfer additional water to SCV Water from the Nickel Water and/or the Semitropic Water Bank to backstop demands. In anticipation of this development, VWC, a PUC regulated private utility then owned by NLF, installed four wells. However, to manage future potential reductions in groundwater levels in the vicinity of these new wells, particularly during drought conditions, the Draft GSP Water Budget Analysis indicated it would be desirable to install several wells located near the confluence of Castaic Creek and the Santa Clara River near the existing “C” wells that are currently used for agricultural production for Newhall Land’s operations in Los Angeles County.

Adequacy of Supply

Three factors affecting the availability of groundwater are (1) sufficient source infrastructure capacity (wells and pumps), (2) sustainability of the groundwater resource to meet pumping demand on a renewable basis, and (3) protection of groundwater sources (wells) from known contamination or from potential sources of contamination. The first two of these are discussed below and the third is discussed in Section 6. The resolution of contamination for aquifer protection is addressed below.

For source infrastructure, existing and planned wells and pumps, SCV Water has a combined pumping capacity from active Alluvial wells of approximately 51,000 gallons per minute (gpm), which translates into a current full-time Alluvial source pumping capacity of approximately 83,000 AFY. The higher individual and cumulative pumping capacities are, of course, primarily for operational reasons (i.e., to meet daily and other fluctuations from average day to maximum day and peak hour system demands). Further, to achieve these levels of production SCV Water must complete treatment facilities to PFAS compliance. The timing for returning PFAS and Perchlorate impacted wells is shown in Tables 4-7B and 4-7C in Appendix E. Alluvial pumping capacity from all the active and future municipal supply wells is summarized in Table 4-7A. The locations of the various municipal Alluvial wells throughout the Basin are illustrated on Figure 4-2.

In terms of adequate source capacity to provide flexible and adaptative management in the sustainable use of groundwater resources, the current and projected availability of Alluvial groundwater source capacity of municipal wells is approximately 83,000 AFY. This source capacity is more than sufficient to meet the 21,400 AFY in 2025 and increases to 30,800 in 2035 (Table 4-6). The higher individual and cumulative pumping capacities are, of course, primarily for operational reasons (i.e., to meet daily and other fluctuations from average day to maximum day and peak hour system demands). As illustrated on Table 4-6, the balance of all Alluvial pumping 37,200 AFY, including non-SCV Water pumping, remains within the operating plan range of 30,000 to 40,000 AFY. Further, to achieve these levels of production SCV Water must complete treatment facilities to PFAS compliance.



Path: Y:\Santa Clarita\Water Report\Data\SCV\GIS\2015 UWMP Figures\Figure 3-2 Alluvial Wells.mxd

LUHDORFF & SCALMANINI CONSULTING ENGINEERS

Figure 4-2
Alluvial Municipal Well Location Map

Sustainability

Until 2003, the long-term renewability of Alluvial groundwater was empirically determined from approximately 60 years of pumping and groundwater level records. Generally, those long-term observations included stability in groundwater levels and storage, with some dry-period fluctuations in the eastern part of the Basin. During this period, the total Alluvial pumpage ranged from a low of about 20,000 AFY to as high as about 43,000 AFY. Those empirical observations have since been complemented by the development and application of a numerical groundwater flow model, which has been used to simulate aquifer response to the planned operating ranges and distribution of pumping. The numerical groundwater flow model has also been used to analyze the control of perchlorate contaminant migration as discussed in Section 5.2.1. The model was used to evaluate the likelihood of perchlorate migration to the then VWC wells, in particular Well Q2 and the wells in the VWC Pardee wellfield. The assessment of perchlorate migration also evaluated the sustainability and reliability of water supplies from the Alluvial aquifer. This analysis (LSCE, 2005) concluded that there was sufficient production capacity in the Alluvium to meet water demands in the case of VWC Well Q2 and/or the Pardee well field being temporarily taken out of service due to perchlorate impacts.

To examine the yield of the Alluvium, or more specifically the sustainability of the Alluvium on a renewable basis, the original groundwater flow model was used to examine the long-term projected response of the aquifer to pumping for municipal and agricultural uses in the 30,000 to 40,000 AFY range under average/normal and wet conditions, and in the 30,000 to 35,000 AFY range under locally dry conditions, documented in the 2005 basin yield analysis (2005 Basin Yield Analysis), prepared by CH2M Hill & LSCE, 2005. To examine the response of the entire aquifer system, the original model also incorporated pumping from the Saugus Formation in accordance with the normal (7,500 to 15,000 AFY) and dry year (15,000 to 35,000 AFY) operating plan for that aquifer. The model was run over a synthetic 78-year hydrologic period, which was selected from actual historical precipitation to examine a number of hydrologic conditions expected to affect both groundwater pumping and groundwater recharge and including projected impacts from climate change.

Simulated Alluvial Aquifer response to the range of hydrologic conditions and pumping stresses was essentially a long-term repeat of the historical conditions that have resulted from similar pumping over the last several decades. The resultant response included (1) generally constant groundwater levels in the middle to western portion of the Alluvium, and fluctuating groundwater levels in the eastern portion as a function of wet and dry hydrologic conditions, (2) variations in recharge that directly correlate with wet and dry hydrologic conditions and (3) no long-term decline in groundwater levels or storage. Consequently, the Alluvial Aquifer was considered in the 2005 UWMP to be a sustainable water supply source to meet the Alluvial portion of the operating plan for the groundwater Basin.

In 2008, partly in preparation for the 2010 UWMP and partly in response to concerns about events expected to impact the future reliability of supplemental water supply from the SWP, an updated analysis was undertaken to assess groundwater development potential and possible augmentation of the groundwater operating plan. In addition to extending the model's calibration, the updated analysis simulated the historical record of climate and incorporated SWP deliveries for those climatic conditions for an 86-year period from 1922 through 2007, in place of the original model's synthetic 78-year hydrologic period that had been developed prior to the availability of combined climate and SWP deliveries since 1922. While the overall operating plan ranges in the updated basin yield analysis did not change from the original operating plan, prevailing land-use conditions and the specific distributions of pumping were found to produce the same kinds of resultant Alluvial groundwater conditions as concluded to be sustainable in 2005 – (1) no long-term declines in Alluvial groundwater levels and storage; (2) multi-year periods of locally declining, or locally increasing, groundwater levels in response to cycles of below-normal and above-normal precipitation and (3) short-term impacts on pumping capacities in eastern parts of the basin due to declining groundwater levels during dry periods, mitigable by short-term redistribution of pumping to wells located in the central and western portions of the Basin (reflected in pumping volumes included in this UWMP) and by conformance with the dry-period reduction in Alluvial pumping in the operating plan (Table 3-5). Based on the results of the updated basin yield analysis (LSCE & GSI, 2009), the operating plan is considered to reflect ongoing sustainable groundwater supply rates. In the Alluvium, sustainability was found via explicit simulation of pumping in wet/normal years near the upper end of the operating plan range. In dry years, sustainability was found via explicit simulation of pumping throughout the dry-year operating plan range, with the additional consideration that some redistribution of municipal pumping (reflected in this UWMP and experienced in the dry years of 2014 and 2015) be implemented to achieve pumping rates near the dry-period range.

The SCV-GSA's work on Basin sustainability for the GSP has advanced the technical understanding of basin conditions since the 2009 basin yield analysis and confirms the previous conclusion. A new groundwater flow model using the U.S Geological Survey software MODFLOW-USG was developed calibrated and peer reviewed. The MODFLOW-USG model improves the spatial resolution and employs more sophisticated methods of representing stream/aquifer interactions among other advancements over the previous model. A more thorough discussion is documented in Development of a Numerical Groundwater Flow Model for the Santa Clara River Valley East Groundwater Subbasin GSI September 22, 2020. Additionally, the GSP Water Budget Analysis reflect updated climate change assumptions provided by DWR. New GSP technical reports defining the extent and nature of groundwater dependent ecosystems informed potential future adjustments of pumping distributions throughout the Alluvial Aquifer and Saugus Formation when considering likely sustainability criteria and potential impacts on groundwater dependent ecosystems. Accordingly, this Plan reflects adjusted pumping distributions that are reflected in Table 4-7A.

While the GSP has not been completed, existing technical resources and analysis are available for public review and can be access at www.scvgsa.org. Information developed to date appears to support the following conclusions relating to sustainability:

1. Chronic Lowering of Groundwater Levels – Alluvium and Saugus Formation pumping consistent with the basin operating plan does not result in chronic lowering of groundwater levels.

2. Reduction of Groundwater Storage - Alluvium and Saugus Formation pumping consistent with the basin operating plan does not result in the long-term groundwater storage depletion.

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Santa Clara River Valley East Groundwater Subbasin Groundwater Sustainability Plan

January 2022

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SCV GSA

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Santa Clara River Valley East Groundwater Subbasin Groundwater Sustainability Plan

January 2022

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Abbreviations and Acronyms

µg	microgram
µg/L	micrograms per liter
AB	Assembly Bill
AF	acre-feet
AFY	acre-feet per year
ASR	aquifer storage and recovery
AVEK	Antelope Valley-East Kern Water Agency
Basin	Santa Clara River Valley Groundwater Basin, East Subbasin
Basin Operating Plan	Groundwater Management Plan, Santa Clara River Valley Groundwater Basin, East Subbasin, Los Angeles County, California
Basin Plan	Water Quality Control Plan: Los Angeles Region Basin Plan for the Coastal Watershed of Los Angeles and Ventura Counties
bc	basement complex
bgs	below ground surface
BMP	best management practice
BVRRB	Buena Vista and Rosedale Rio-Bravo Water Storage Districts
BVWSD	Buena Vista Water Storage District
CalGEM	California Geologic Energy Management Division
Caltrans	California Department of Transportation
CASGEM	California Statewide Groundwater Elevation Monitoring
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CGPS	continuous global positioning system
City	City of Santa Clarita
CLWA	Castaic Lake Water Agency
COC	constituent of concern
CRWQCB	California Regional Water Quality Control Board
DAC	disadvantaged community
DCR	Delivery Capability Report
DDT	dichlorodiphenyltrichloroethane
DDW	Division of Drinking Water
DEM	digital elevation model
DEW	drier with extreme warming
DMS	Data Management System
DQO	data quality objective
DTSC	Department of Toxic Substances Control
DWR	Department of Water Resources
E-log	electronic log

ESA	Environmental Science Associates
ESI	Environmental Simulations, Inc.
ET	evapotranspiration
FivePoint	FivePoint Holdings, LLC
Forest Service	U.S. Department of Agriculture Forest Service
FPB	Fillmore and Piru Basins
ft	foot or feet
ft/day	foot or feet per day
ft/ft	foot per foot
ft/mile	foot per mile
ft^2/day	square feet per day
ft^3/ft^3	cubic feet per square foot per foot
GDE	groundwater dependent ecosystem
General Plan	City of Santa Clarita General Plan
GHB	general head boundary
GIS	geographic information system
GPS	global positioning system
GSA	Groundwater Sustainability Agency
GSI	GSI Water Solutions, Inc.
GSP	Groundwater Sustainability Plan
GSSI	Geoscience Support Services, Inc.
GWE	groundwater elevation
GWMP	Groundwater Management Plan
I-5	Interstate 5
ID	identification
iGDE	GDE indicators
in/hr	inch per hour
in/yr	inch or inches per year
InSAR	Interferometric Synthetic Aperture Radar
IRWMP	Integrated Regional Water Management Plan
JPA	Joint Exercise of Powers Agreement
KJ	Kennedy Jenks
L	liter
LA	Los Angeles
LA County	County of Los Angeles
LACDPW	Los Angeles County Department of Public Works
LACDRP	Los Angeles County Department of Regional Planning
LACFCD	Los Angeles County Flood Control District
LACWD	Los Angeles County Waterworks District No. 36, Val Verde
LADPW	Los Angeles County Department of Public Works
LADWP	Los Angeles Department of Water and Power

LARWQCB	Los Angeles Regional Water Quality Control Board
LiDAR	Light Detection and Ranging
LSCE	Luhdorff and Scalmanini Consulting Engineers
MA	management area
MCL	maximum contaminant level
mg/L	milligrams per liter
MGD	million gallons per day
mm	millimeter
MO	measurable objective
MOU	memorandum of understanding
msl	mean sea level
MT	minimum threshold
NAD 83	North American Datum of 1983
NAVD 88	North American Vertical Datum of 1988
NCCAG	Natural Communities Commonly Associated with Groundwater
NCWD	Newhall County Water District
Newhall Land	The Newhall Land and Farming Company
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWD	Newhall Water Division (formerly Newhall County Water District)
NWI	National Wetland Inventory
OVOV	One Valley One Vision
PCBs	polychlorinated biphenyls
PCE	tetrachloroethylene
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
Plan	Santa Clara River Valley East Groundwater Basin Groundwater Sustainability Plan
ppb	parts per billion
ppm	parts per million
PVC	polyvinyl chloride
Qa	Quaternary Alluvium
QA/QC	quality assurance/quality control
Qt	terrace deposits
QTs	Saugus Formation
QTsr	Sunshine Ranch Member
Qtsu	upper portion of Saugus Formation
RCH	Recharge Package for MODFLOW-USG
RCS	Richard C. Slade & Associates LLC
RL	reporting limit
RMS	representative monitoring site

RRBWBP	Rosedale-Rio Bravo Water Banking Program
RRBWSD	Rosedale-Rio Bravo Water Storage District
RWQCB	Regional Water Quality Control Board
S	storativity
SAC	Stakeholder Advisory Committee
SB	Senate Bill
SCAG	Southern California Association of Governments
SCV	Santa Clarita Valley
SCV Water	Santa Clarita Valley Water Agency
SCV-GSA	Santa Clarita Valley Groundwater Sustainability Agency
SCVGWFM	Santa Clarita Valley Groundwater Flow Model
SCVSD	Santa Clarita Valley Sanitation District of Los Angeles County
SCWD	Santa Clarita Water Division (formerly Santa Clarita Water Company)
SFR	Streamflow Routing Package for MODFLOW-USG
SGMA	Sustainable Groundwater Management Act
SMC	sustainable management criteria
SMCL	secondary maximum contaminant level
SMCs	sustainable management criteria
SMGA	Sustainable Groundwater Management Act
SNMP	Salt and Nutrient Management Plan
SWAMP	Surface Water Ambient Monitoring Program
SWP	State Water Project
SWRCB	State Water Resources Control Board
SWRU	Stored Water Recovery Unit
T	transmissivity
Tc	Castaic Formation
TCE	trichloroethene
TDS	total dissolved solids
Tms	Modelo Formation
Tm	Mint Canyon Formation
TNC	The Nature Conservancy
Tp	Pico Formation
Tt	Towsley Formation or Tick Canyon Formation
Tv	Vasquez Formation
Tvb	Violin Breccia
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTS	unarmored three-spine stickleback
UWCD	United Water Conservation District
UWMP	Urban Water Management Plan

VOC	volatile organic compound
VWD	Valencia Water Division (formerly Valencia Water Company)
WDR	Waste Discharge Requirements (WDR)
WKWD	West Kern Water District
WMW	warmer with moderate warming
WQO	water quality objective
WRP	water reclamation plant
WUE SP	Water Use Efficiency Strategic Plan
WY	water year

Executive Summary

ES-1 Introduction

Even though you can't see it, groundwater is one of our most valuable resources. Some of the water you use for drinking, cooking, bathing, watering your yard, irrigating your land—even filling your pool—comes from groundwater pumped from aquifer systems underlying the Santa Clarita Valley. Without this important local supply, we would have to buy additional water from other sources. This imported water is more expensive and less reliable during drought. Managed by the Santa Clarita Valley Groundwater Sustainability Agency (SCV-GSA), the two local aquifers that comprise the Santa Clara River Valley East Groundwater Subbasin (Basin) are the primary sources of all local groundwater for prime farmland and hundreds of thousands of people living and working in the Santa Clara River Valley (Valley).

Under the Sustainable Groundwater Management Act (SGMA), which was passed in January of 2015 by the state legislature, local water agencies are required to develop a detailed road map for maintaining or bringing their groundwater basin into a healthy balance (i.e., a sustainable condition) within the next 20 years. When a basin is in a healthy balance, pumping water out of the aquifers is balanced with the inflow from rainfall that recharges the aquifers, thereby ensuring there is enough water for the Valley's population as well as for the Santa Clara River and the lush habitat for plants, fish, amphibians, reptiles, and birds that helps make this valley such an enjoyable place to live. We are very fortunate in our basin because we have a groundwater resource that is sustainable under a range of climate and pumping conditions and we believe, based on sound science, that this condition will continue into the foreseeable future without any undesirable results.

The SGMA law established deadlines for reaching sustainability (in this basin, our focus is on maintaining sustainability) and empowered local agencies to form groundwater sustainability agencies (GSAs) to manage groundwater basins and develop groundwater sustainability plans (GSPs), such as this document. In his signing statement, Governor Brown emphasized that "groundwater management in California is best accomplished locally." To that end, the Santa Clarita Valley Water Agency (SCV Water), the City of Santa Clarita (City), the County of Los Angeles (LA County), and the Los Angeles County Waterworks District No. 36, (LACWD), serving Val Verde, signed a legal agreement to collaborate as the SCV-GSA.

This Santa Clara River Valley East Groundwater Subbasin GSP provides information about the area affected by this plan, the basin setting, the quantitative methods (sustainable management criteria, or SMCs) for evaluating the health (sustainability) of the Basin, the monitoring networks, projects and management actions to achieve sustainability, and the implementation plan for the GSP. This document also includes the list of references and technical studies used in the development of this plan and several supporting appendices. The SCV-GSA has taken many steps, starting with stakeholder engagement, to complete the GSP in accordance with the requirements of the California Department of Water Resources (DWR). The following graphic shows the activities leading to the final accepted GSP.

Work on the GSP began in 2017 with community workshops, an active website, and input from a stakeholder advisory committee made up of local environmental and business interests, groundwater pumpers, and residents. This public process has focused on balancing the perspectives and well-being of all groundwater users. This plan considers the sources and uses of water from the Basin and the changes that might occur due to population growth and other factors, particularly changes in rainfall, streamflows, and climate change. SCV-GSA also studied groundwater dependent ecosystems, or GDEs, which are habitats in which plants and animals rely on groundwater for survival.

This background helped SCV-GSA establish sustainable management criteria to avoid undesirable results for a number of sustainability indicators spelled out in SGMA, including chronic lowering of groundwater levels, reduced groundwater in storage, degraded water quality, land subsidence, and depletion of surface water. SGMA also requires that GSAs identify GDEs and DWR requires assessing the effects of changing groundwater levels on GDEs. The GSP includes a robust monitoring program and defines projects and management actions that have been developed to ensure long-term groundwater sustainability. Fortunately, we have learned through development of this plan that the Basin is operating in a sustainable manner and the river habitat is resilient over wet and dry periods.

Over the past five decades, many studies have been conducted in the Basin relating to water demand, water supply, and water quality. For the first time, all this information has been assembled in one place, this GSP. This GSP also considers the interests of all those who depend on groundwater in the Basin, including domestic well owners, agricultural interests, municipal well owners and operators, and interest groups and individuals who work to protect GDEs—all of whom are represented on the SCV-GSA Stakeholder Advisory Committee. This GSP has been planned and developed collaboratively by the SCV-GSA member organizations, with review and input from the Stakeholder Advisory Committee, and input from the public. The organization of this plan is as follows:

- **Section 1 – Introduction to the Santa Clara River Valley East Subbasin Groundwater Sustainability Plan:** An introduction to the GSP, including a description of its purpose and a brief description of the Basin.
- **Section 2 – Agencies' Information:** Information on the SCV-GSA as an organization and a brief description of each of the SCV-GSA member organizations, including information on the legal authority of the GSA to plan and coordinate groundwater sustainability for the Basin.
- **Section 3 – Description of Plan Area:** A detailed description of the Basin, land uses in the Basin, existing wells and monitoring programs, existing groundwater management plans and regulatory programs, any programs for conjunctive use, and urban land use programs.
- **Section 4 – Hydrogeologic Conceptual Model:** An explanation of the hydrogeologic conceptual model developed for the Basin that includes water sources and uses, a general description of water quality, and a description of the data gaps in the current model.
- **Section 5 – Groundwater Conditions:** A detailed description of the groundwater conditions, including groundwater levels and flow directions, changes in storage, the potential for seawater intrusion or land subsidence to occur, locations where surface water and groundwater are interconnected, the identification and distribution of groundwater-dependent ecosystems (GDEs), and a discussion of groundwater quality for drinking water and agricultural irrigation.
- **Section 6 – Water Budgets:** A presentation of the historical, current, and projected future water budgets for the Basin, including quantification of the estimated change in storage for the historical, current, and projected future water budgets.
- **Section 7 – Monitoring Networks:** A detailed description of the monitoring objectives and monitoring programs for groundwater levels, storage, water quality, land subsidence, and interconnected surface water; the locations of representative monitoring sites and a description of the data management and reporting system.
- **Section 8 – Sustainable Management Criteria:** Defines the sustainability goal for the Basin, describes the process through which SMCs were established; describes and defines SMCs pertaining to chronic lowering of groundwater levels, reduction in groundwater storage, seawater intrusion, degraded water quality, land subsidence, and depletion of interconnected surface water; defines management areas for the Basin, and describes how management-area operations will avoid undesirable results.
- **Section 9 – Management Actions and Projects:** A list and description of each project and management action to address data gaps, describe procedures that will be followed if undesirable results are observed, and obtain information needed to manage the Basin. Optional projects intended to improve resiliency to drought are also included.
- **Section 10 – Groundwater Sustainability Plan Implementation:** Presents a planning-level estimate of implementation costs and a schedule for proposed projects and management actions.
- **Section 11 – Notice and Communications:** Presents SCV-GSA's communications and engagement planning and implementation, public feedback and stakeholder comments on the plan, how feedback was incorporated into the plan, and responses to comments received.

Summaries of the key technical sections of this GSP are presented below.

ES-2 Hydrogeologic Conceptual Model (GSP Sections 4 and 5)

Sections 4 and 5 of the GSP present a narrative that describes the physical setting of the Basin and its groundwater conditions. This narrative is called a hydrogeologic conceptual model; it describes how the Basin groundwater system works. The hydrogeologic conceptual model is based on the available body of data and prior studies of the Basin's geology, hydrology, and water quality. In this GSP, the hydrogeologic conceptual model is the foundation on which water budget analyses are conducted and sustainable management criteria are developed. However, the hydrogeologic conceptual model is not a static narrative; it also incorporates the results of the water budget and SMC development efforts and will continue to evolve over time as data from future monitoring programs described in this GSP are collected and interpreted.

ES-2.1 Principal Aquifer Systems

Figure ES-1 is a diagram depicting the two principal aquifers in the Basin (the surficial Alluvial Aquifer and the Saugus Formation), their sources of recharge, and the mechanisms by which groundwater is discharged from these aquifers in the Basin. The thickness of the Alluvial Aquifer varies along the length of the Santa Clara River, reaching a maximum thickness of about 200 feet at several wells in the center of the Valley. The alluvial sediments generally thin progressively away from the valley center towards the surrounding hills. The Saugus Formation underlies the Alluvial Aquifer and is present throughout all but the easternmost portion of the Basin. The upper portion of the Saugus Formation is up to 5,000 feet thick and consists of coarse-grained sand and gravel beds that contain usable groundwater. Generally, the upper 500 to 2,000 feet of the upper portion of the Saugus Formation is accessed by groundwater supply wells. The lower portion of the Saugus Formation (the Sunshine Ranch Member) is up to 3,500 feet thick and is composed of fine-grained sediments with low permeability and does not provide groundwater in sufficient quantity or adequate quality for municipal or other uses.

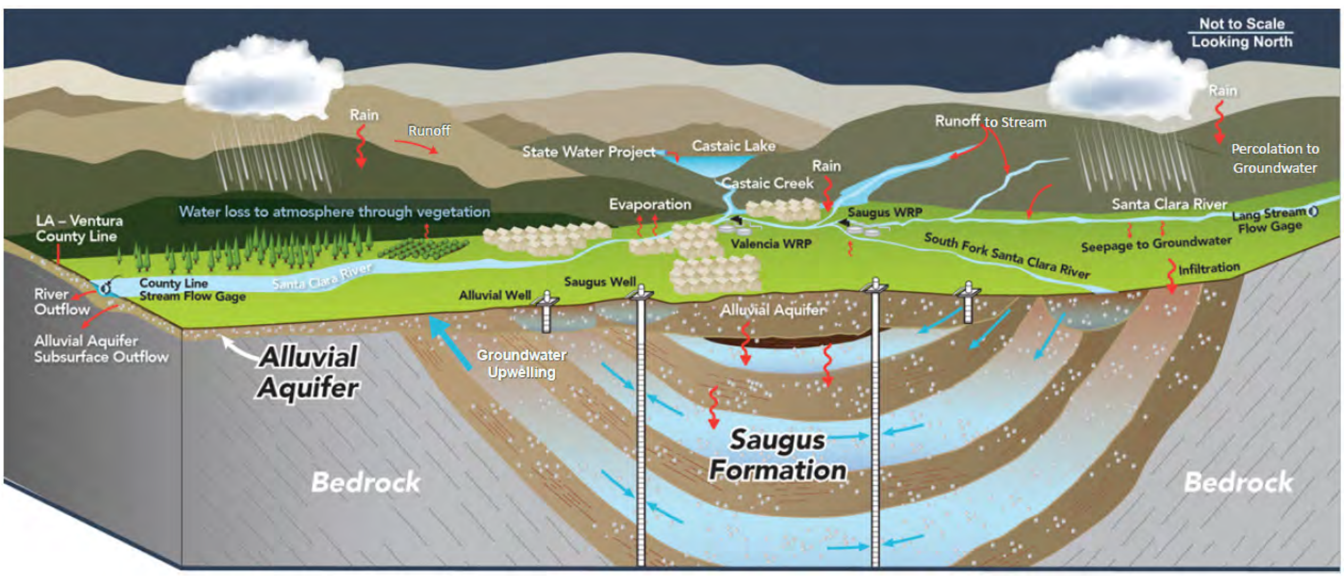

Figure ES-1. The Two Principal Aquifers in the Basin: the Alluvial Aquifer and the Saugus Formation

ES-2.2 Groundwater-Surface Water Interactions

The Santa Clara River is the primary surface water drainage feature in the Basin, flowing generally from east to west. The river is in direct connection with the Alluvial Aquifer system. In the eastern portion of the Basin, the river is ephemeral, with its periodic stormwater flows serving to recharge the Alluvial Aquifer. In the western and central portions of the Basin, groundwater discharges into the river beginning at approximately the mouth of San Francisquito Canyon (just east of I-5). The river also has an indirect connection with the Saugus Formation in the western portion of the Basin, which is an area where the Saugus Formation is discharging its water into the Alluvial Aquifer, and thereby providing an upwards driving force for groundwater to discharge into the Santa Clara River in certain localized reaches west of I-5 at certain times.

The amount and direction of the exchange between the Santa Clara River and the alluvial groundwater system in the Basin is dependent on a number of factors including cycles of wet/normal/dry rainfall conditions, water reclamation plant (WRP) discharges to the river, releases from Castaic Reservoir, evapotranspiration from riparian vegetation (native and invasive species) along the river corridor, stormwater flows, and groundwater pumping. Importation of State Water Project water into the Basin began in the 1980s and has increased the recharge into the Basin from urban irrigation and discharges from the WRPs, resulting in a net increase in the amount of water in the groundwater/surface water system.

ES-2.3 Recharge and Discharge in the Basin

Sources of natural recharge to groundwater in the Basin are:

- Streamflow infiltration from runoff along the Santa Clara River and its tributaries.
- Deep percolation of direct rainfall.
- Subsurface groundwater inflow from upstream areas along the Santa Clara River and its tributaries.
- Upward groundwater flow from certain portions of the Saugus Formation where it is overlain by alluvium, primarily in areas west of Bouquet Canyon.

Sources of anthropogenic (human-made) recharge to groundwater in the Basin are:

- Deep percolation of irrigation water as urban irrigation (landscape irrigation) in the developed areas of the groundwater basin and from areas that are farmed.
- Infiltration of reclaimed water that is actively treated by and discharged from the Saugus WRP and the Valencia WRP. Both plants are operated by the Los Angeles County Sanitation District and together discharge approximately 18 million gallons of treated water per day to the Santa Clara River, with an average annual discharge of approximately 20,000 acre-feet per year (AFY). A portion of the treated water from the Saugus WRP is discharged to the Santa Clara River northwest of the intersection of Bouquet Canyon Road and Valencia Boulevard, while the remainder is conveyed to the Valencia WRP for additional treatment and then released to the Santa Clara River west of Interstate 5.
- Treated water from septic systems in unsewered areas is an additional source of groundwater recharge.

Discharges from the Basin's groundwater system are:

- Groundwater extraction for municipal, agricultural, and domestic supply uses.
- Evapotranspiration (evaporation from plant leaves) by phreatophyte vegetation (plants living in proximity to the river and tributaries). Phreatophytes are native plants such as willows and cottonwoods, as well as invasive species such as *Arundo donax* (*Arundo*) and tamarisk, that root directly into or just above the water table in areas of shallow groundwater.
- Groundwater discharge from the Alluvial Aquifer to the Santa Clara River in the westernmost part of the Basin. The amount of flow into the river at any given time depends largely on water levels within the alluvium.
- Groundwater underflow out of the Basin into Ventura County, which occurs through a relatively thin veneer of alluvium that is present on top of the Pico Formation at the western basin boundary.

Groundwater wells completed in the Alluvial Aquifer in the eastern part of the Basin (at and upstream of the Saugus WRP) have water levels that are heavily influenced by climatic conditions, exhibiting gradual declines of several tens of feet over 5- to 10-year periods when there are below-normal periods of rainfall, followed by rapid recoveries during wet periods. Generally, one to two consecutive wet years can provide enough recharge to replenish the Alluvial Aquifer in the eastern part of the Basin. Alluvial Aquifer wells in the central and western portion of the Basin show smaller responses to rainfall cycles, particularly downstream of the

Valencia WRP where the Saugus Formation discharges groundwater into the Alluvial Aquifer. Saugus Formation wells also show smaller and more delayed responses to rainfall cycles than are seen in the eastern portion of the Alluvial Aquifer.

With some exceptions, the quality of groundwater in the Basin's two primary aquifer systems is suitable for drinking water and agricultural uses.

- Concentrations of salts and nutrients (e.g., total dissolved solids, chloride, sulfate, nitrate) meet federal drinking water standards, but in some cases, depending upon location, do not meet the state water quality objectives (WQOs) set by the Los Angeles Regional Water Quality Control Board (RWQCB). For example, concentrations of total dissolved solids (TDS, a measure of salt content) and sulfate exceed the WQO in some locations. A salt and nutrient management plan (SNMP) was approved by the RWQCB for the Basin in 2016 and this plan is used to manage salt and nutrient concentrations in the Basin.
- Groundwater contamination—including perchlorate, tetrachloroethylene (PCE), trichloroethylene (TCE), and per- and polyfluoroalkyl substances (PFAS)—has been detected in several wells. SCV Water is installing wellhead treatment on all affected wells to make sure water served to its customers meets drinking water standards and continues to closely monitor its wells. SCV Water is also actively coordinating with the state RWQCB and the Department of Toxic Substances Control, agencies that are investigating sources of contamination and managing the remediation of the contamination.

ES-2.4 Groundwater Dependent Ecosystems (GDEs)

GDEs are defined under SGMA as "ecological communities of species that depend on groundwater emerging from aquifers or on groundwater occurring near the ground surface". GDE types include seeps and springs; wetlands and lakes; terrestrial vegetation connected to shallow groundwater; and rivers, streams and estuaries. Figure ES-2 shows the locations of GDEs in the Basin, as identified through screening methods developed by The Nature Conservancy, field mapping and verification, and local data on the spatial and temporal variations in the water table depth below ground surface. Much of the acreage associated with the mapped GDEs occurs in the main stem of the Santa Clara River. However, many smaller potential GDEs are identified in the tributaries reaching into the higher elevations. Some potential GDEs in the higher elevations may be fed from higher elevation seepage disconnected from the main groundwater basin.

The GDEs consist of both riparian and aquatic habitat.

- **Riparian habitat** in the Basin supports several special status avian species including the least Bell's vireo and southwestern willow flycatcher. These species are found in the willow and riparian mixed hardwood forests occurring along the length of the Santa Clara River in the central and western portions of the Basin. Riparian habitat requires a reliable water source. Willow forests occur in areas where groundwater is available year-round. Willow root zones occur most prominently within 1 to 5 feet below the surface but may reach depths of up to 8 feet. Root depths of mature cottonwood trees may reach over 16 feet.
- **Aquatic habitat** in the Basin may support several special status species, including the arroyo toad and native fishes, including the unarmored three-spined stickleback fish (UTS), and the Santa Ana sucker. The UTS have been found in only a few locations in the watershed upstream of the Valencia WRP. Recently, the UTS has been located upstream of the Valencia WRP outfall, making the short upstream segment at the Santa Clara River Bridge (I-5 Bridge) where small volumes of groundwater upwelling occur, a particularly important location.

9.6.2 Removal of Invasive Species

Invasive plant species, consisting primarily of *Arundo donax* (*Arundo*), have become established within the riparian area along the Santa Clara River and some of its tributaries. A literature review by The Nature Conservancy (TNC) (2019) identified 12 studies of water use by *Arundo*, which together provide water use estimates ranging between 1.8 and 48 AF/acre/year, with mean and median and mean values of 8.3 and 12.3 AF/acre/year, respectively. While not required, the GSA will continue to support efforts by others to raise money for invasive species removal projects.

9.6.3 Optional Managed Aquifer Recharge Projects

Principal aquifers in the groundwater basin are the Alluvial Aquifer and Saugus Formation. Each aquifer accepts natural groundwater recharge in different ways. The Alluvial Aquifer is exposed at the ground surface in the Santa Clara River and its tributaries, but alluvial sediments are also present outside of these areas (a.k.a. “off stream”). The Saugus aquifer is exposed throughout much of the valley where not covered by alluvial sediments. Existing groundwater recharge to these aquifers is provided naturally from precipitation, and from urban processes including dry weather runoff, irrigation, and water reclamation plant discharges.

Managed groundwater recharge can utilize water sources such as stormwater, excess imported water, and/or recycled water to meet multiple goals within the watershed including reducing stormwater runoff, increasing the use of recycled water, and augmenting groundwater supplies for drought. Recharge can be accomplished by distributing water to infiltration areas where it drains by gravity into the soils, or through injection wells where water is pumped to aquifer zones below. Efforts to characterize additional groundwater recharge opportunities in the Basin have been underway for many years and in recent years some field studies have been implemented to test areas for recharge capability.

In 2015, a Water Resources Reconnaissance Study was commissioned by Castaic Lake Water Agency and performed by Carollo Engineers. This study conducted screening of numerous potential recharge areas within the valley. It identified areas with geology suitable for additional groundwater recharge, and it also identified areas that did not have sufficient aquifer material to accept meaningful amounts of recharge.

Informed by this work, additional work has taken place ranging from defining initial concepts to looking at specific sites, conducting environmental review, test well installation, infiltration testing, and monitoring to develop a baseline.

Because undesirable results from groundwater extraction have not been identified, implementation of these kinds of projects is not required and thus are considered optional. A description of these optional projects is presented below.

9.6.3.1 Old Castaic School Site Recharge and/or Potential Eastern Recharge

In response to the findings in the Water Resources Reconnaissance Study, the former Newhall County Water District commissioned Geosyntec, Trussell Technologies, and GSI Water Solutions, Inc. to conduct a focused groundwater recharge feasibility studies in the eastern portion of the valley and near the Castaic Lagoon (completed in 2016/17). Based on the water quality and hydrogeological considerations presented in the feasibility studies, the reports concluded that groundwater recharge using surface spreading in the Upper Santa Clara River Watershed showed promise and warranted further field investigation. In July of 2019, SCV Water contracted GSI Water Solutions, Inc. to assess these potential recharge sites.

Work at the Castaic site to date includes a review for environmental contamination, infiltration testing, aquifer parameter estimates, installation of an observation well, data collection, and estimation of potential recharge amounts, and travel time of infiltrated water to a nearby well. Work in the eastern part of the Basin has included field reconnaissance, a review for environmental contamination, and review of “off stream” locations.

9.6.3.2 Recharge Using Potable Water in the Vicinity of the Placerita Nature Center

SCV Water operates a potable water supply line delivering water to residents in Placerita Canyon. This water supply is within the right of way of Placerita Canyon nearby Placerita Nature Center. Due to past concerns raised by stakeholders about drought stress and drought caused die-off of oak trees in a limited area of the Nature Center property, SCV Water is considering providing excess potable supply through a pipe and delivery structure to limited areas during drought to mitigate drought effects.

9.6.3.3 Off Stream Recharge Using Recycled Water

In 2016 Castaic Lake Water Agency prepared a draft Recycled Water Master Plan that among other things, considered use of recycled water for groundwater recharge at multiple locations within the valley. A number of sites adjacent to the Santa Clara River were evaluated, including off stream storage south of the river near Via Princessa, and further east in the Basin. The role of recharge with recycled water should continue to be evaluated.

9.6.3.4 Aquifer Storage and Recovery

Injection wells can be used to inject water into aquifers to help recharge aquifers, and also provide water for recovery at a later date. No such projects are under evaluation at this stage, but they may be evaluated in the future by municipal water suppliers. Water for injection could come from excess state water, or banked water.

9.6.3.5 Bouquet Canyon Creek Restoration

Historically, Bouquet Canyon Creek benefited from steady releases of water from the Bouquet Canyon Reservoir. Annually, the releases were approximately 2,000 AFY. This flow benefited creek habitat and groundwater recharge. Several years ago, a debris flow into the creek necessitated a reduction in discharges from the reservoir in order to avoid flooding the adjacent well-traveled road and creating a safety issue. As a result of these reduced discharges, approximately 11,000 AF of reservoir water has been withheld over time, reducing recharge that supplies shallow wells in the canyon and reducing basin recharge. LA County, along with state and federal regulatory agencies, have considered options to restore the creek and ultimately allow full reservoir releases to begin again, but a final solution remains to be arrived at. The GSA will cooperate with LA County, the City of Santa Clarita, CDFW, U.S. Forest Service, landowners, and other stakeholders to facilitate projects that seek the restoration of flows in Bouquet Creek.

9.6.4 Estimated Cost

Because these groundwater management actions and projects are considered optional at this time and have not been fully evaluated, detailed costs for planning, permitting, and development of any specific project are not provided at this time. However, the GSA may choose to investigate these management actions and projects during the next two fiscal years and so an initial budget for feasibility studies, California Environmental Quality Act (CEQA) analysis, preliminary design, and project development is provided in Table 9-4.

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