2020 Santa Clarita Valley Water Report

Luhdorff & Scalmanini
Consulting Engineers

Santa Clarita Valley Water Agency

Los Angeles County Water Works District No. 36

AUGUST 2021

2020 Santa Clarita Valley Water Report | August 2021

PREPARED FOR

SCV WATER

SANTA CLARITA VALLEY WATER AGENCY

PREPARED BY

Luhdorff & Scalmanini
Consulting Engineers

PROFESSIONAL GEOLOGIST
WILLIAM L. HALLIGAN
No. 7056
STATE OF CALIFORNIA

William L. Halligan, PG
Senior Principal Hydrogeologist

Lisa Lavagnino, GIT
Project Geologist

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDICES

LIST OF ABBREVIATIONS AND ACRONYMS

Acronym	Meaning	Acronym	Meaning
af	acre-feet	PCE	Tetrachloroethylene
afy	acre-feet per year	PFAS	Per- and Polyfluoroalkyl Substances
Basin	Santa Clara River Valley Groundwater Basin	PTF	Perchlorate Treatment Facility
BiOp	Biological Opinion	PWS	Public Water System
BV-RRB	Buena Vista/Rosedale-Rio Bravo	RRBWBP	Rosedale-Rio Bravo Water Banking Program
BVWSD	Buena Vista Water Storage District	RRBWSD	Rosedale-Rio Bravo Water Storage District
CDPH	California Department of Public Health	RWMP	Recycled Water Master Plan
CEQA	California Environmental Quality Act	SATP	Saugus Aquifer Treatment Plant
CIMIS	California Irrigation Management Information System	SCV-GSA	Santa Clarita Valley Groundwater Sustainability Agency
CLWA	Castaic Lake Water Agency	SCVSD	Santa Clarita Valley Sanitation District of Los Angeles County
CVP	Central Valley Project	SCV	Water Santa Clarita Valley Water Agency
DDW	Division of Drinking Water	SCWD	Castaic Lake Water Agency's Santa Clarita Water Division
DTSC	California Department of Toxic Substances Control	Semitropic	Semitropic Water Storage District
DWR	California Department of Water Resources	SGMA	Sustainable Groundwater Management Act
EIR	Environmental Impact Report	SOC	Synthetic Organic Chemicals
GPCD	gallons per capita per day	SPTF	Saugus Perchlorate Treatment Facility
GSA	Groundwater Sustainability Agency	SWP	State Water Project
GSI	GSI Water Solutions, Inc.	SWRCB	State Water Resources Control Board
GSP	Groundwater Sustainability Plan	SWRU	Stored Water Recovery Unit
GWMP	Groundwater Management Plan	TCE	Trichloroethylene
HA	Hydrologic Area	TDS	Total Dissolved Solids
JPA	Joint Power Authority	μg/L	micrograms per liter
LACFCD	Los Angeles County Flood Control District	USBR	United States Bureau of Reclamation
LACWD 36	Los Angeles County Waterworks District No. 36	USEPA	United States Environmental Protection Agency
LADPW	Los Angeles County Department of Public Works	USFWS	United States Fish and Wildlife Service
LADWP	Los Angeles County Department of Water and Power	UWCD	United Water Conservation District
LSCE	Luhdorff and Scalmanini Consulting Engineers	UWMP	Urban Water Management Plan
MCL	Maximum Contaminant Level	Valley	Santa Clarita Valley
mg/L	milligrams per liter	VOC	Volatile Organic Compound
MOU	Memorandum of Understanding	VWC	Valencia Water Company
NCEI	National Centers for Environmental Information	VWD	Valencia Water Division
NCWD	Newhall County Water District	WUESP	Water Use Efficiency Strategic Plan
NWD	Newhall Water Division	WKWD	West Kern Water District
NMFS	National Marine Fishery Service	WRP	Water Reclamation Plant

Executive Summary

This annual water report, which is the twenty-third in a series that began to describe water supply conditions in 1998, provides current information about the water requirements and water supplies of the Santa Clarita Valley (Valley). Historically, this report has been prepared for the Valley's water purveyors, currently the Santa Clarita Valley Water Agency (SCV Water) and Los Angeles County Waterworks District No. 36 (LACWD 36).

This report provides information about local groundwater resources, State Water Project (SWP) and other imported water supplies, recycled water, and water conservation. It also includes discussion about the Valley's Groundwater Operating Plan (2009), the Urban Water Management Plan (2015 and recently updated for 2020), and the development of a Groundwater Sustainability Plan in accordance with the Sustainable Groundwater Management Act of 2014. The report reviews the sufficiency and reliability of supplies in the context of existing water demand, with focus on actual conditions in 2020, and it provides a short-term outlook of water supply and demand for 2021.

ES.1 2020 Water Requirements and Supplies

2020 was characterized by below average precipitation locally and statewide, increased demand for imported water supplies due to loss of local groundwater wells impacted by updated regulations related to PFAS (Per- and Polyfluoroalkyl Substances), and a slight increase in demand from the prior year. In 2020, total water requirements in the Valley were approximately 77,500 acre-feet (af), of which approximately 67,250 af were for municipal use and the remainder (10,250 af) was for agricultural and other (miscellaneous) uses, including individual domestic uses. Total demand in 2020 was four percent higher than in 2019, and about seven percent lower than the projection in the 2015 Urban

Table ES-1. Santa Clarita Valley Summary of 2020 Water Supplies and Uses (af)

Municipal	
Imported Water	48,196
Groundwater	18,553
Recycled Water	468
Subtotal	**67,217**
Agriculture and Miscellaneous	
Groundwater	10,249
Subtotal	**10,249**
TOTAL	**77,466**

Water Management Plan (UWMP). Total water requirements in 2020 were met by a combination of approximately 28,800 af from local groundwater resources (approximately 18,550 af for municipal and approximately 10,250 af for agricultural and other uses), approximately 48,200 af of SWP and other imported water, and approximately 500 af of recycled water. Water uses and supplies in 2020 are summarized in **Table ES-1**.

ES.2 Groundwater

Out of 28,800 af of total groundwater pumping in the Valley in 2020, approximately 16,800 af were pumped from the Alluvium and 12,000 af were pumped from the Saugus Formation. Based on the groundwater basin yield, the groundwater operating plan in the 2015 UWMP and recently adopted 2020 UWMP includes pumping from the Alluvium in the range of 30,000 to 40,000 acre-feet per year (afy) following wet/normal years, and slightly reduced pumping (30,000 to 35,000 afy) following dry years. Pumping from the Alluvium in 2020 was below the operating plan range for the Alluvium following dry years reflecting a management decision not to deliver water from wells where the concentration of Per- and polyfluoroalkyl substances (PFAS) exceed the Response Levels identified by the State of California unless well head treatment has been implemented. There were no adverse effects on groundwater levels and storage in the basin that have not normally occurred during previous dry periods in the basin. On average, pumping from the Alluvium has been approximately 32,000 afy since supplemental imported water became available in 1980. That average annual amount remains near the lower end of the range of operational yield for a wet/normal year and approximately mid-range for a dry period.

In general, throughout a large part of the basin, groundwater levels in the Alluvium have varied within predictable ranges that are associated with climatic fluctuations during the last 41 years with short-term declines during dry periods followed by recoveries during wet periods. Above average precipitation in late-2004 and 2005, in 2010 and early-2011, and 2019, resulted in significant water level recovery in the eastern part of the basin despite the recent multi-year dry period (2006 through 2020), when water levels declined to the low end of the historic range. In 2020, despite the dry conditions, water levels generally rose due to the reduced pumping in many areas of the basin. This continues the overall trend of fluctuating groundwater levels within a generally constant range over the last 41 years. These ongoing data indicate that the Alluvium can continue to support pumping in the operating range included in the 2015 UWMP and recently adopted 2020 UWMP without adverse results (e.g., long-term water level decline or degradation of groundwater quality).

Based on an integration of water quality records from multiple wells completed in the Alluvium, there have been historical fluctuations in groundwater quality, typically associated with variations in precipitation and streamflow. However, like groundwater levels, there has been no long-term trend toward groundwater quality degradation; groundwater produced from the Alluvium remains a viable municipal and agricultural water supply.

The groundwater operating plan in the 2015 UWMP and recently adopted 2020 UWMP includes pumping from the Saugus Formation in the range of 7,500 to 15,000 afy in normal years; it also includes planned dry-year pumping from the Saugus of 15,000 to 25,000 afy for one year, between 21,000 to 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. Similar to the operating plan for the Alluvium, the ranges of pumping from the Saugus Formation are based on the evaluation of groundwater basin yield, which found those ranges of pumping to be sustainable on a long-term basis.

Pumping from the Saugus Formation was approximately 12,000 af in 2020; this included approximately 2,800 af that were pumped from the Saugus 1 and Saugus 2 Wells, 1,200 af that were pumped from V201 as part of the perchlorate pump and treat program, and 450 af pumped from the Saugus Aquifer Treatment Plant (SATP) on the former Whittaker-Bermite Facility. On average, pumping from the Saugus Formation has been approximately 7,700 afy since 1980. Both the 2020 amount and the long term average rates remain near the mid to lower end of the ranges included in the groundwater operating plan. On a short-term timeframe, Saugus pumping since 2006 has been higher at approximately 9,400 afy, and while there have been declining trends in groundwater elevations in the Saugus Formation since then, the trends likely reflect the generally dry climatic conditions, and increased pumping from storage that have existed during that time.

SCV Water prioritizes the delivery of clean water that meets all state and federal health standards. They continue to address ongoing water quality issues and newly emerging constituents of concern. Long-term work toward the remediation of perchlorate contamination, first discovered in 1997 in several Saugus wells, continued in 2020. The objective of the perchlorate restoration and containment plan has been to stop the migration of the contaminant plume and restore the lost well capacity through a pump and treat method. SCV Water's Saugus Perchlorate Treatment Facility (SPTF) has been online since 2011, and a second Perchlorate Treatment Facility (PTF) came online at V201 in 2017 where treated water is currently being discharged to the stormwater system pending final permitting from DDW. A third Saugus Aquifer Treatment Plant (SATP), not operated by SCV Water, came online in 2017 on the former Whittaker-Bermite site, and together these three facilities have now treated a combined amount of almost 36,900 af.

In 2019, the California Water Board Division of Drinking Water enacted new testing requirements for PFAS and established notification levels and a health advisory level for these man-made chemicals that had been commonly used in industry and consumer products until recently. Upon testing, SCV Water identified several of their wells that exceeded these new limits and immediately began to investigate and implement treatment options. Construction of the first water treatment plant to address PFAS contamination was completed in October of 2020, and plans are underway for construction at the next two sites with target completion dates of early and mid-2022.

ES.3 Imported Water Supplies

Historically consisting of only its SWP Table A Amount, SCV Water's imported water supply now comprises additional sources of water acquired from the SWP, the Buena Vista Water Storage District (BVWSD) and Rosedale-Rio Bravo Water Storage District (RRBWSD) in Kern County, and other sources outside of the Valley. SCV Water's contractual Table A amount is 95,200 af of water from the SWP. SCV Water receives 11,000 afy of non-project water under the 2007 Water Acquisition Agreement with BVWSD and the RRBWSD (BV-RRB).

SCV Water is currently entered into four long-term groundwater banking and water exchange programs and has, in aggregate, almost 142,000 af of recoverable water outside the local groundwater basin at the end of 2020. The first component of SCV Water's overall groundwater banking program is with Semitropic Water Storage District (Semitropic), now called the Stored Water Recovery Unit (SWRU) whereby, SCV Water can withdraw up to 5,000 afy from the current balance of 40,278 af of water that was stored in the SWRU to meet Valley demands when needed in dry years. The second component, the Rosedale-Rio Bravo Water Banking Program (RRBWBP) in Kern County, has a recoverable total of approximately 98,810 af in storage with a withdrawal capacity of 10,000 afy (up to 20,000 afy is permitted if other RRBWSD pumping capacity is available for use). The other components are the Two-For-One Exchange Programs that SCV Water initiated with Antelope Valley-East Kern Water Agency (AVEK), and United Water Conservation District (UWCD) that now have a combined amount of 2,844 af of recoverable water.

SCV Water's final allocation of SWP water for 2020 was 20% of its Table A Amount, or 19,040 af. The total imported water supply in 2020 was 62,294 af, including the Table A supply, 11,000 af purchased from BV-RRB, 16,051 af in RRBWSD banking and exchange programs, 1,406 af from the AVEK 2-for-1 Exchange Program, 5,000 af from the Semitropic SWRU, 500 af from the West Kern WD Exchange Program, 284 af of Yuba Accord Water, and 9,013 af of 2019 SWP carryover water available in 2020. 2020 SCV Water deliveries to service connections and LACWD 36 were 48,196 af with the remaining water carried over to 2021 (13,466 af), and some (632 af) loss through meter reading differences and use through operations.

ES.4 2021 Water Supply Outlook

In 2021, total Valley-wide water demand is projected to be approximately 86,000 af. It is expected that water demands in 2021 will continue to be met with a mix of water supplies that primarily includes local groundwater, SWP Table A and other imported supplies, and recycled water. Ongoing conservation programs are expected to continue to reduce demands on water supplies in 2021 although some increase in demands is anticipated with continued growth within the service area as well as the overall dry conditions encountered in 2021.

Announced on March 23, 2021, the latest allocation of water from the SWP for 2021 was 5 percent of SCV Water's Table A Amount, or 4,760 af. Combined with the total available water supplies from local groundwater from the two aquifer systems (42,180 af), carryover of SWP Table A allocation from 2020 (13,466 af of which 7,000 af anticipated for 2021 use), annual acquisition through the BV-RRB Acquisition Agreement (11,000 af), RRBWSD Water Banking Program (16,000 af) withdrawals from the Semitropic SWRU (5,000 af), Dry Year water Purchases (600 af), Yuba Accord Water (1,000 af), and recycled water (450 af), the total available water supplies for 2021 is approximately 94,456 af. As a result, SCV Water anticipates having more than adequate supplies to meet all water demands in 2021.

In any given year, SWP supplies may be reduced due to dry weather conditions or regulatory factors. During such an occurrence, the remaining water demands are planned to be met by a combination of alternate supplies such as returning water from SCV Water's accounts in the SWRU, the RRBWBP, and three Exchange Programs (with total banked water at almost 142,000 af), deliveries from SCV Water's flexible storage account in Castaic Lake Reservoir, local groundwater pumping, short-term water exchanges, and participation in DWR dry-year water purchase programs.

Drought periods may affect available water supplies in any single year and even for a duration that spans multiple consecutive years. It is important to note that hydrologic conditions vary from region to region throughout the state. Dry conditions in northern California affecting SWP supply may not affect local groundwater and other supplies in southern California, and the reverse situation can also occur. For this reason, SCV Water has emphasized developing a water supply portfolio that is diverse, especially in dry years along with water conservation programs. Diversity of supply is considered a key element of reliability, giving the Agency the ability to draw on multiple sources of supply to ensure reliable service during dry years, as well as during normal and wet years.

ES.5 Water Conservation

SCV Water is committed to continued water conservation and water use efficiency programs in the Valley. Building upon conservation successes achieved over the past twenty years, SCV Water's programs, policies, and practices include several conservation measures designed to lower per capita demands by 2020. The conservation measures incorporate education, incentives, and conservation mandates among all the various customers present in the Valley. As a member of the California Water Efficiency Partnership (CalWEP), SCV Water prioritizes urban water use efficiency and conservation in their management strategy and public messaging.

As mandated by the Water Conservation Act of 2009 (SBx7-7) and initially described in the 2010 and 2015 UWMP, SCV Water has demonstrated compliance with the Interim Daily Per Capita Water Use Target every year since 2015 through 2020. And while seven of the last ten years saw dry conditions for the Valley and a continued growth in service connections, the residents, businesses, and city and county government agencies have continued to respond to the calls for conservation in 2020 with a total reduction in municipal water use from 2013 of almost 7,500 af.

In 2018, the California State Legislature enacted AB 1668 and SB 606 (Conservation Long-term Framework) to build upon the SBx7-7 20% reduction in gallons per capita day by 2020 which sunset on December 31, 2020, Currently, SCV Water is coordinating with the Department of Water Resources, the State Water Resources Control Board, and other urban water suppliers across the state to determine and document both requirements and methodologies for implementation of the framework. The AB 1668 and SB 606 compliance period starts on July 1, 2022 and concludes on June 30, 2023. SCV Water will provide its first conservation performance report to the state by January 1, 2024.

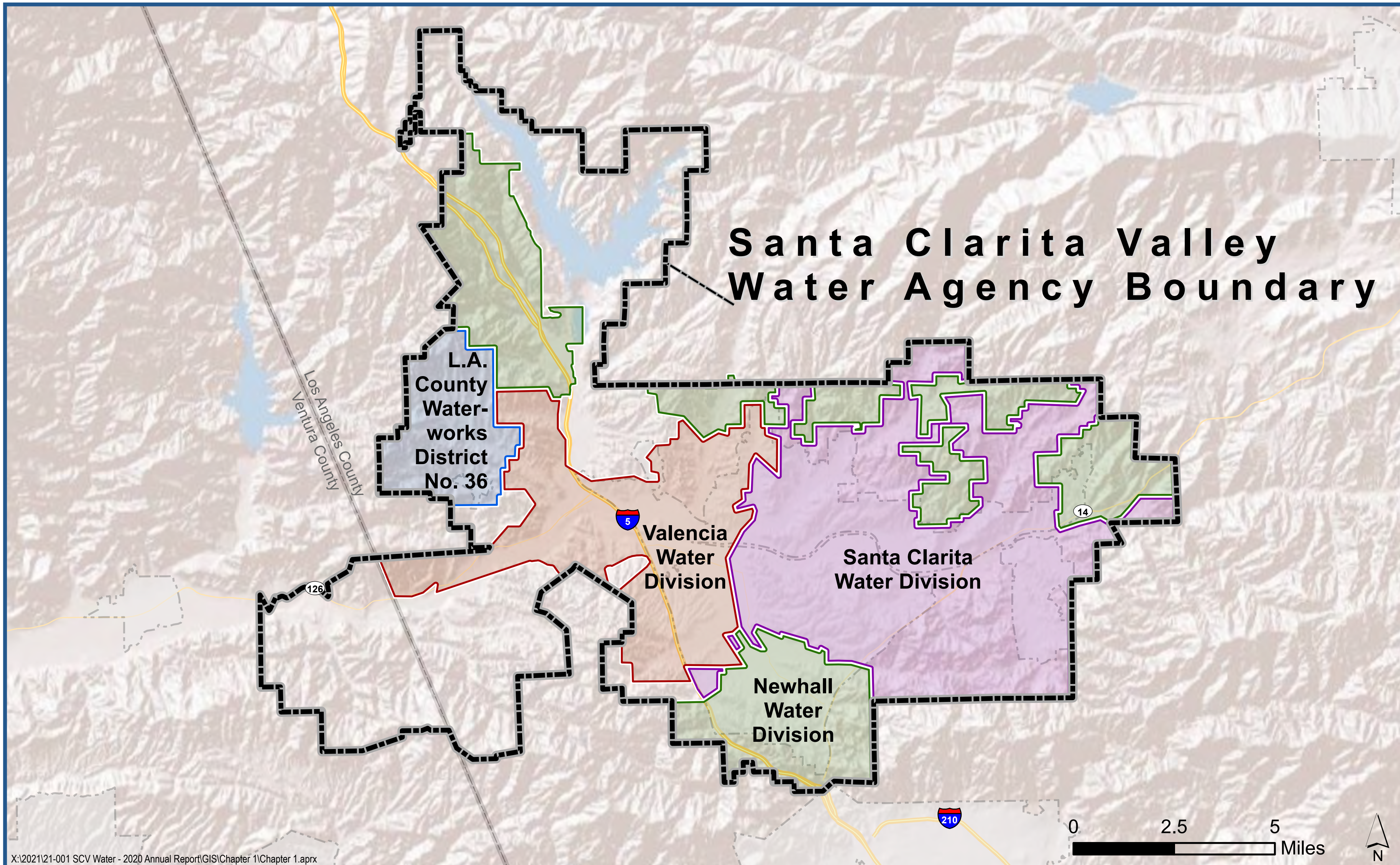
Chapter 1
Introduction

This report was prepared for SCV Water and LACWD 36 to provide information regarding water uses and the availability of water supplies on an annual basis, along with a summary of groundwater conditions. It is intended to be a helpful resource for use by water planners and local land use planning agencies. This report is complemented by the 2015 UWMP and recently adopted 2020 UWMP for the area, which provides longer-term water supply planning over a 35-year period, and by several other technical reports, some of which are specifically referenced herein.

For more than 40 years, the Santa Clarita Valley Water Agency, formerly the Castaic Lake Water Agency (CLWA) and the four retail water purveyors, have reviewed and reported on the availability of water supplies to meet all water requirements in the Santa Clarita Valley. Those reports have also addressed local water resources, most notably groundwater, in the region. Past studies have assessed the condition of local groundwater aquifers, their hydrogeologic characteristics, aquifer storage capacity, operational yield and recharge rate, groundwater quality and contamination, and the ongoing conjunctive use of groundwater and imported water resources.

1.1. Background

For most residents of the Santa Clarita Valley, domestic water service is provided by the Santa Clarita Valley Water Agency and the Los Angeles County Waterworks District No. 36. SCV Water operates under 7 separate Division of Drinking Water Public Water System (PWS) codes. Recently, SCV Water permitted a number of interconnections between the former separate distribution systems in order to improve operational efficiency and provide additional water reliability through redundancy. Together, SCV Water, which includes Santa Clarita Water Division (SCWD), Newhall Water Division (NWD), and Valencia Water Division (VWD), and LACWD 36 provide water to approximately 73,700 service connections. SCV Water contracts for State Water Project (SWP) and other sources of imported water, which are delivered from the California Aqueduct and discharged into Castaic Lake. From Castaic Lake, the water is treated, filtered, and disinfected at two SCV Water treatment plants before distribution to service connections and LACWD 36. SCV Water also contracts with the Santa Clarita Valley Sanitation District (SCVSD) for recycled water, which is currently delivered to VWD. The SCV Water and Division service areas are shown in **Figure 1-1**.



Luhdorff & Scalmanini
Consulting Engineers

SCVWA and Water Divisions

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 1-1

While municipal water supply has grown to become the largest category of water use in the Valley, there remains agricultural and private water demands that are solely dependent on local groundwater supplies. Accordingly, ongoing agricultural water requirements and the use of local groundwater to meet those requirements are considered in analyses of water requirements and supplies as reported herein. The information on the locations, construction details, annual pumping volumes and other information for the small fraction of Valley residents reliant on private wells for water supply are not collected by any agency. In the absence of detailed information on private wells and associated water use, pumping as reported herein includes an estimate of groundwater pumped from private wells.

In 2009 an updated analysis of groundwater basin yield was completed to guide the ongoing use of groundwater and the associated distribution of pumping to maintain sustainable groundwater use and address localized issues such as groundwater contamination (with a focus on perchlorate) that had impacted local groundwater supplies since 1997. The results of the updated groundwater basin analysis are summarized in the groundwater basin yield discussion (Section 3.1) of this Water Report and analysis has been further refined with material prepared for the Draft Groundwater Sustainability Plan (GSP).

1.2. Purpose and Scope of the Report

The purpose of this report, which is the 23rd in a series of annual water reports that began to describe water supply conditions in 1998, is to provide current information about water requirements and available water supplies to meet the needs of the Santa Clarita Valley.

With the implementation of the Sustainable Groundwater Management Act (SGMA), a Groundwater Sustainability Plan (GSP) will replace the GWMP and the role that this annual report fulfills in the GWMP. However, this report still serves the requirements requested by the LA County Board and the MOU with the UWCD. The purpose of the MOU was to establish a joint monitoring program between the two parties to ensure that there is a

The preparation of this series of annual reports is in response to these actions:

- A request made originally by the Los Angeles County Board of Supervisors in 1998 and subsequently required under the Newhall Ranch Specific Plan;
- A Memorandum of Understanding (MOU) between the upper basin water purveyors (including LACWD 36 and former Castaic Lake Water Agency, Newhall County Water District and Valencia Water Company) and the United Water Conservation District (UWCD) in 2001;
- The Santa Clarita Valley GWMP in 2003.

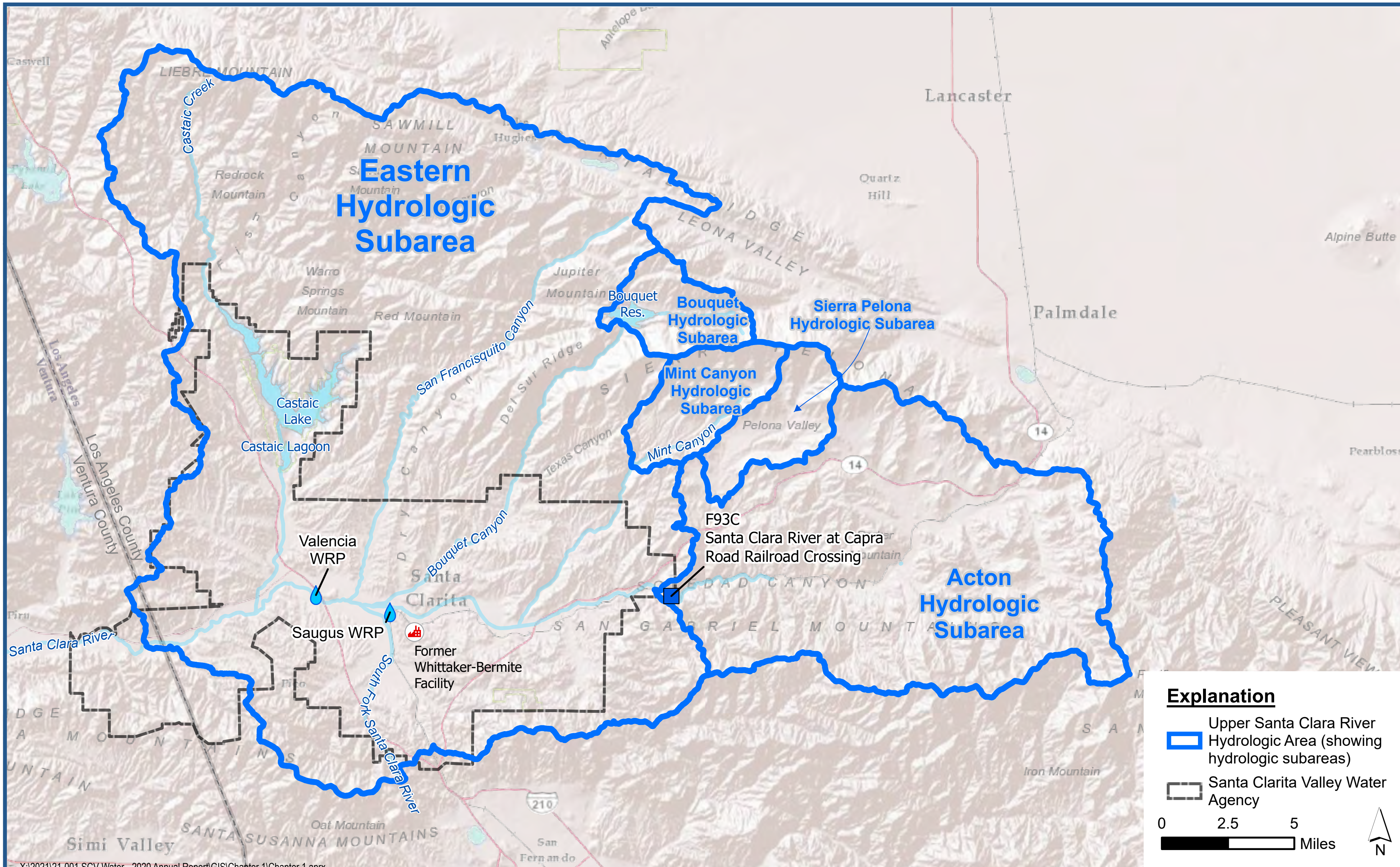
continued regional understanding of water resources along the Santa Clara River. This joint monitoring program includes database management, groundwater flow modeling, basin yield estimates, and an expansion on the annual reporting which began for the Upper Santa Clara River basin in 1998. In October 2018, a new Memorandum of Understanding was entered into by SCV Water and UWCD to build upon and compliment the 2001 MOU, whereby both parties continue to enhance and maintain a productive and collaborative relationship with the purpose of exploring cooperative water resource management strategies to enhance the conjunctive use of imported water, groundwater, recycled water, and surface water within the region.

1.3. Santa Clarita Valley Water Divisions and LACWD 36

As introduced above, SCV Water along with LACWD 36 provide water service to most residents of the Santa Clarita Valley. **Figure 1-1** shows the Santa Clarita Water Division that includes a portion of the City of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Saugus, Canyon Country, and Newhall with approximately 32,240 service connections, the Newhall Water Division includes portions of the City of Santa Clarita and unincorporated portions of Los Angeles County in the communities of Newhall, Canyon Country, Valencia, Tesoro and Castaic with approximately 9,750 service connections, and the Valencia Water Division with a service area which serves approximately 30,330 service connections in a portion of the City of Santa Clarita and in the unincorporated communities of Castaic, Newhall, Saugus, Stevenson Ranch, Mission Village, and Valencia. Los Angeles County Waterworks District No. 36 has a service area that encompasses the Hasley Canyon area and the unincorporated community of Val Verde. LACWD 36 has approximately 1,390 service connections.

1.4. The Upper Santa Clara River Hydrologic Area and East Groundwater Subbasin

The Upper Santa Clara River Hydrologic Area (HA), as defined by the California Department of Water Resources (DWR), is located almost entirely in northwestern Los Angeles County (**Figure 1-2**). The area encompasses approximately 654 square miles of flat valley land (approximately 6% of the total area) and hills and mountains (approximately 94% of the total area) that border the valley area. The mountains include the Santa Susana and San Gabriel Mountains to the south, and the Sierra Pelona and Leibre-Sawmill Mountains to the north. Elevations range from approximately 800 feet on the valley floor to approximately 6,500 feet in the San Gabriel Mountains.



Luhdorff & Scalmanini
Consulting Engineers

Upper Santa Clara River Hydrologic Area

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 1-2

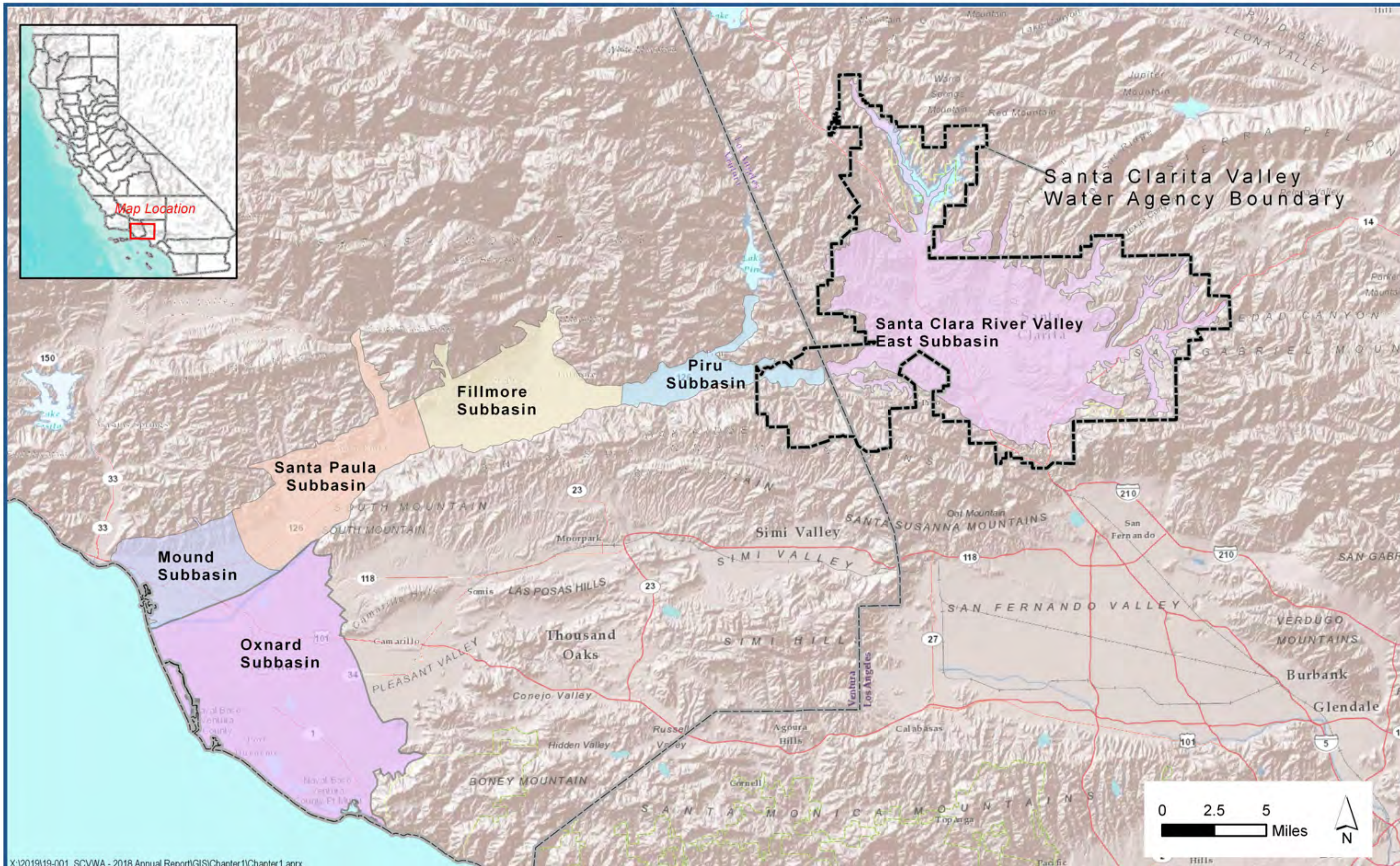
The headwaters of the Santa Clara River are at an elevation of approximately 3,200 feet at the divide separating the HA from the Mojave Desert. The HA comprises four subareas as shown on **Figure 1-2**. Of the four, the Eastern Hydrologic Subarea has been the study area of prior investigations, and it will remain the focus of this report.

Leibre-Sawmill Mountains

The Santa Clara River and its tributaries flow intermittently from Lang Station westward approximately 35 miles to just west of the Los Angeles-Ventura County line, where the River is the outlet from the HA. The principal tributaries of the Santa Clara River in the Santa Clarita Valley are Castaic Creek, San Francisquito Creek, Bouquet Creek, and the South Fork of the Santa Clara River. In addition to intermittent natural tributary inflow and discharge from Castaic Lake and Bouquet Reservoir, the Santa Clara River receives treated wastewater discharge from the Saugus and Valencia Water Reclamation Plants, which are operated by SCVSD. In addition, a minor amount of groundwater treated for perchlorate removal from the Whitaker-Bermite site is also discharged into the river upstream of the WRPs. The Santa Clara River flows westward through Ventura County near Oxnard. Along that route, the River traverses all subbasins of the Santa Clara River Valley Groundwater Basin (Basin). There are six subbasins that compose the Basin and they span across Los Angeles and Ventura counties. From east to west the subbasins are the Santa Clara River Valley East, Piru, Fillmore, Santa Paula, Mound, and Oxnard as shown in **Figure 1-3**. The Santa Clara River Valley East Subbasin (Subbasin), beneath the Santa Clarita Valley, is the source of essentially all local groundwater used for water supply in the Santa Clarita Valley and the focus of this report.

There are four active precipitation gages in the Subbasin. Two gages have long-term records (greater than 40 years), the Newhall Fire Station #73 gage (data record since 1931) and the SCVWA-Pine Street gage (data record since 1979), while the other two, CIMIS Station #204 Santa Clarita (established in 2006) and Canyon Country (established in 2010), have relatively shorter-term records as compared to the other two gages. THE CIMIS Station #204 Santa Clarita and Canyon Country are used for comparative purposes (**Figure 1-4**) to the other two gages with longer-term records when evaluating multi-decade trends in local precipitation patterns and occurrence of local wet, dry, and normal hydrologic periods.

The Los Angeles County Department of Public Works (LADPW) maintains and collects the precipitation data recorded at the Newhall Fire Station #73 gage, while recording of precipitation began at the SCVWA-Pine Street gage in 1979 when it was part of Newhall County Water District and currently SCV Water. The data collected from these two gages correlate closely, although the SCVWA-Pine Street gage has historically recorded a higher amount (approximately 25%) than the Newhall Fire Station #73 gage over the entire SCVWA-Pine Street gage period of record (1979-2020). The overall difference in precipitation amounts at the two gage locations is likely due to the differences in location between the two gages, with the SCVWA-Pine Street gage situated farther south in the hills rimming the southern edge of the Santa Clarita Valley at an elevation of approximately 1,390 feet, while the Newhall Fire Station #73 gage is located northwest of the SCVWA-Pine Street gage and further away from the hills at an elevation of approximately 1,330 feet.

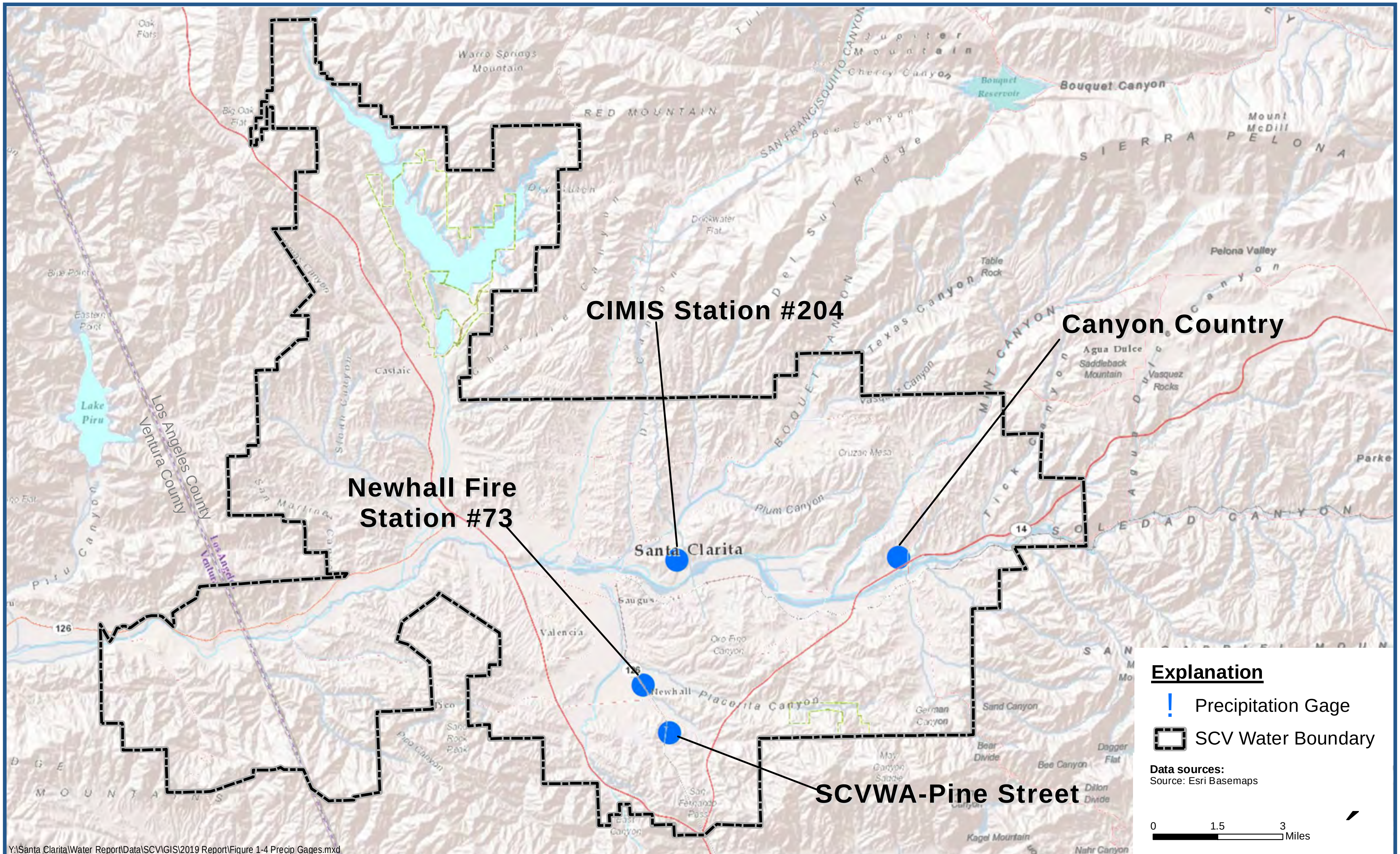


Luhdorff & Scalmanini
Consulting Engineers

Santa Clara River Valley Groundwater Basin and Subbasins

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 1-3



Luhdorff & Scalmanini
Consulting Engineers

Precipitation Gage Locations

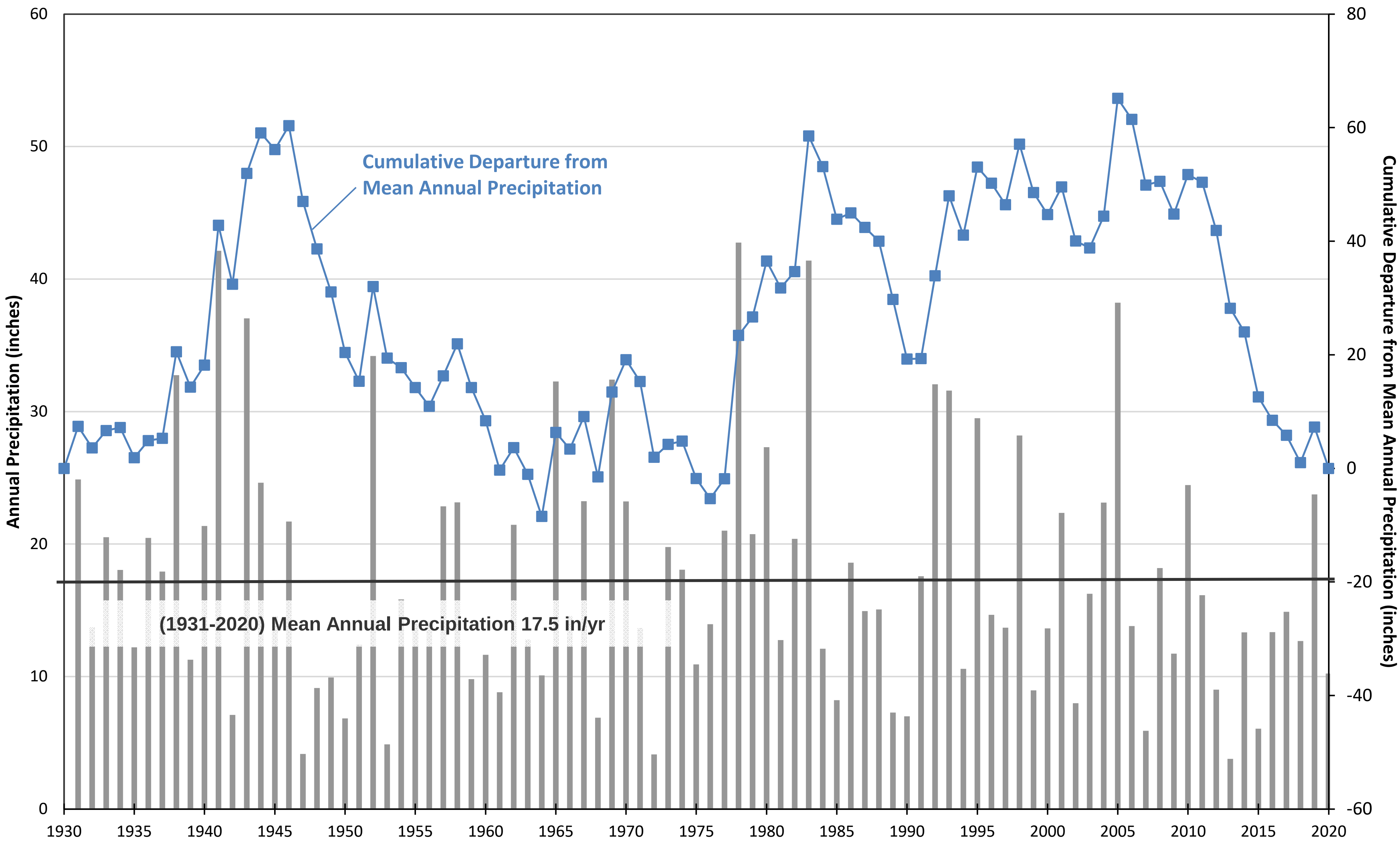
Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 1-4

The third gage, #204 Santa Clarita, was established in December 2006 near the Rio Vista Treatment Plant (elevation 1,410 feet) near the main Santa Clara River channel and on the north side of the Valley (**Figure 1-4**). This gage is operated by SCV Water and is included in the network of gages and related data reported in the California Irrigation Management Information System (CIMIS) managed by DWR. Daily precipitation data collected at this gage are available beginning in January 2008. These data correlate well with the other two precipitation gages in the Valley over the period of 2008 through 2020, with the exception of data for the month of December 2010 and January 2017. The fourth gage, Canyon Country, reported by National Centers for Environmental Information (NCEI), is located farther east in the Valley near Sand Canyon Road and the Santa Clara River. Daily precipitation data at this location are available beginning in January 2010, and these data also correlate well with the other three precipitation gages in the Valley over the period of record (2010-2020) except for November and December 2019 where some daily data were not reported. Comparison of historical data collected from all four gages between 2010 through 2020 indicates the SCVWA-Pine Street gage receives the most precipitation followed by the Newhall Fire Station Gage #73, Canyon Country, and CIMIS Station #204.

The Santa Clarita Valley is characterized as having an arid climate. Historically, intermittent periods of below-average precipitation have typically been followed by periods of above-average precipitation in a cyclical pattern, with each above average or below average period typically lasting from one to five years with some exceptions. The longer-term precipitation records for the Newhall Fire Station #73 gage are illustrated in **Figure 1-5**. Long-term annual (calendar year) average precipitation at that gage is 17.5 inches calculated for the 1931 through 2020 period. **Figure 1-5** also shows the cumulative departure from mean annual precipitation which shows periods of above average rainfall (increasing slope or trend with time) and below average rainfall (declining trend or slope with time). In general, periods of below-average precipitation have been longer and more moderate (slopes are less steep) than periods of above average precipitation (where slopes are generally steeper). Historically, the periods from 1947 to 1964, 1971 to 1976, 1984 to 1991 and 1999 to 2003 have generally been drier than average; the periods from 1938 to 1946, 1965 to 1970, 1977 to 1983, 1992 to 1996, and 2004 to 2005 have been wetter than average. Since 2006, the region has generally experienced a prolonged dry period spanning 15 years through 2020. Generally, the 2006 through 2020 period has experienced the longest and most severe dry period since the 1947 to 1964 period.

Precipitation in the 2020 calendar year was below the long-term average at 10.2 inches. Early 2021 has also seen below average rainfall in the Santa Clarita Valley, while year-to-date demand has been greater than 2020 early year (January through April) demand. These conditions combined with water supply considerations, anticipated growth in service area connections, and continued water conservation measures, discussed in Chapters 3, 4, and 5 are expected to result in 2021 water requirements being more than the water requirements in 2020.



Luhdorff & Scalmanini
Consulting Engineers

Annual Precipitation and Cumulative Departure from Mean Annual Precipitation at Newhall Fire Station #73 Gage

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 1-5

Chapter 2
2020 Water Supplies and Use

Water supplies in the Valley are utilized for municipal, agricultural, private domestic, and miscellaneous purposes. The sources of water are varied and include imported water from the SWP and water banking sources, along with local supplies from groundwater and recycled water.

2.1. 2020 Water Supplies

Total water use in the Santa Clarita Valley was approximately 77,500 af in 2020. Of the total, 67,250 af were for municipal use and the remaining 10,250 af were for agricultural and other (miscellaneous) uses, including estimated individual private domestic and environmental uses (**Table 2-1**) and (**Figure 2-1**). Total water use was met by a combination of approximately 28,800 af from local groundwater resources (approximately 18,550 af for municipal supply and 10,250 af for agricultural and other uses), 48,200 af from SWP and other imported water sources, and approximately 500 af from recycled water (**Figure 2-2**).

Table 2-1. Summary of 2020 Water Supplies and Uses (af)

Municipal	
Imported Water	48,196
Groundwater	18,553
Recycled Water	468
Subtotal	**67,217**
Agriculture and Miscellaneous	
Groundwater	10,249
Subtotal	**10,249**
TOTAL	**77,466**

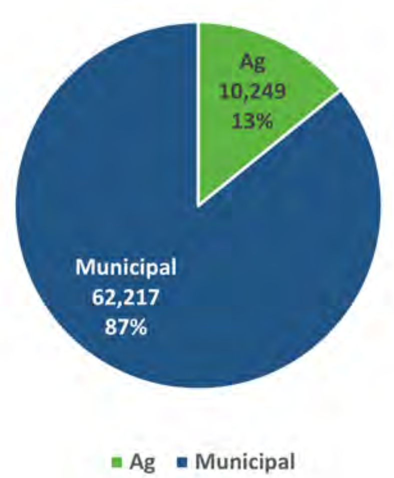


Figure 2-1. Water Use by Sector

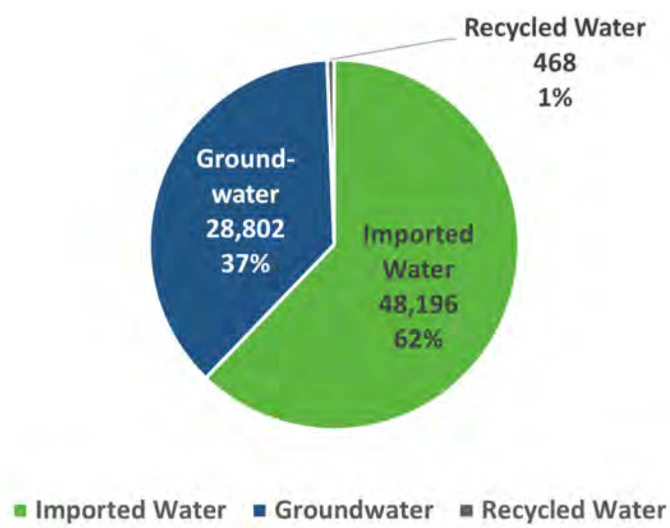


Figure 2-2. Water Use by Source

Compared to 2019, total water use in the Santa Clarita Valley in 2020 was 4% higher, and it was below the short-term projected water requirements estimated in the 2015 UWMP and the 2019 Water Report.

2.2. Historical Water Use Trends

Table 2-2. Total Water Supply Utilization (af)				
Year	Imported Water	Groundwater	Recycled Water	Total
2011	30,808	49,213	373	80,394
2012	35,558	49,420	428	85,406
2013	43,281	45,930	400	89,611
2014	33,092	47,497	474	81,063
2015	24,148	41,972	450	66,570
2016	31,130	40,688	507	72,325
2017	46,651	29,841	501	76,993
2018	41,999	37,982	352	80,333
2019	42,072	31,737	458	74,267
2020	48,196	28,802	468	77,466

Water supply utilization for all uses in the Santa Clarita Valley for the ten-year period 2011 through 2020, is summarized in **Table 2-2**.

The annual utilization of local groundwater and imported water since 1980, complemented by the addition of recycled water, are graphically illustrated in **Figure 2-3**. Detailed summary tables of water utilization by municipal and agricultural entities over the complete record beginning in 1980 (when SWP supplies were first delivered into the Valley) are provided in Appendix A. As depicted in **Figure 2-3**, total water use in the Valley was nearly linearly increasing from the early 1980s (approximately 35,000 af) through 2007 (92,000 af), with some climatic-related fluctuations in certain years. Since 2007, total water use has declined back to levels last seen in the late 1990s (77,500 af in 2020). The increasing trend between 1980 and 2007 was followed by a decreasing trend seen in **Figure 2-3**. The initial decline is associated with the economic slowdown that began in 2008, however, subsequent declines can be associated with increasing drought awareness and increased conservation efforts during the 2013 to 2016 drought, and conjunctive use in 2017 and 2019 when imported supplies were plentiful.

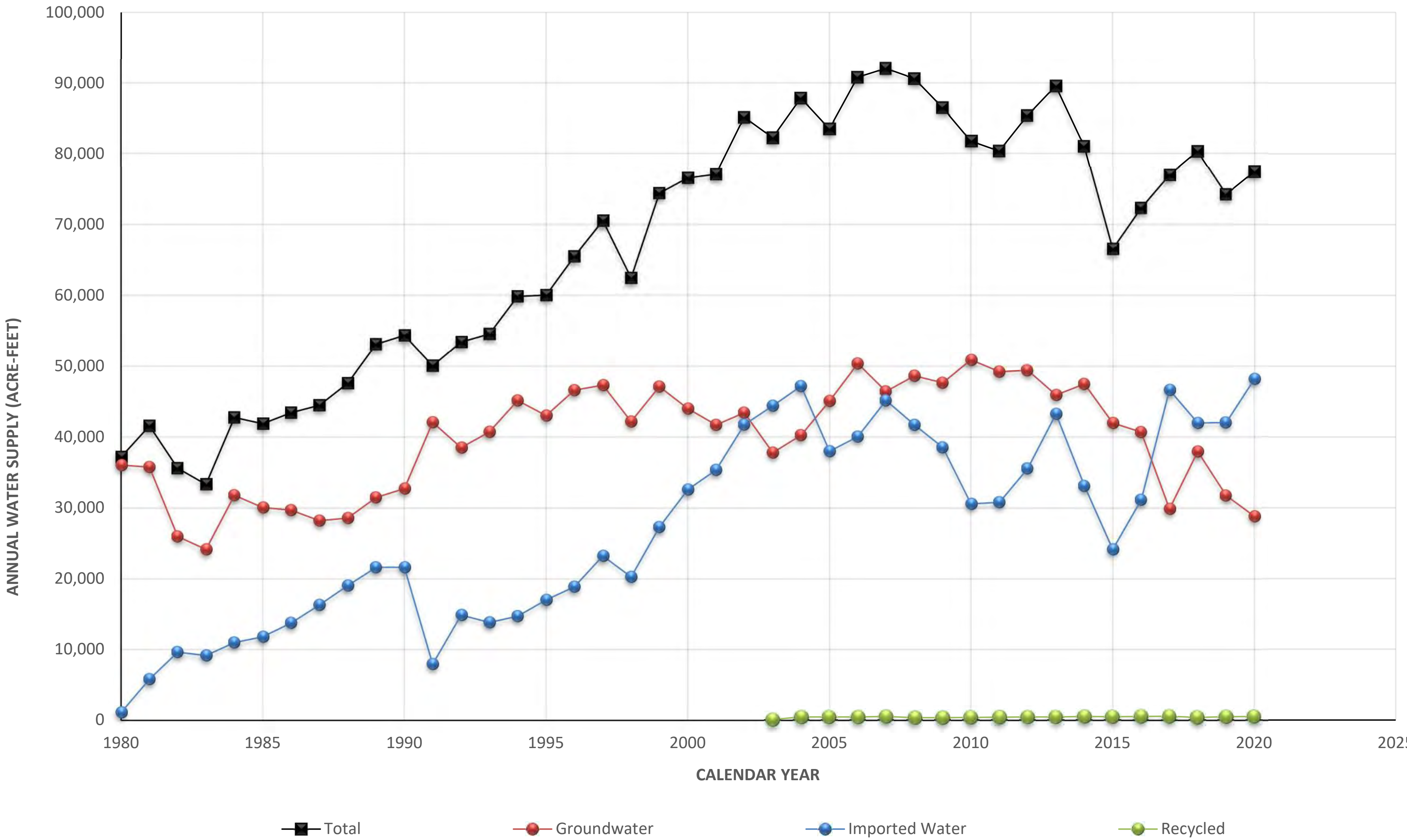
As can also be seen by inspection of **Figure 2-3**, most of the historical increase in water demand from 1980 through 2020 has been met with generally greater proportions of imported water. Total groundwater use has generally remained constant through 2014. Since then, groundwater use declined in 2015 and 2016 due to drought conservation measures, in 2017 and 2019 as higher SWP allocations provided the opportunity to reduce draws on the groundwater basin after the drought, and in 2020 when wells were taken out of service due to PFAS.

2.3. Municipal Water Use

Recent municipal water use and service connections over the past 10 years are summarized in **Table 2-3**; detailed use by SCV Water and LACWD 36 over the longer-term period (1980-2020) is provided in Appendix A.

Table 2-3. Municipal Water Supply Utilization and Service Connections			
Year	Municipal Water Use (af)	Service Connections	Use per Service Connection (af)
2011	64,955	70,313	0.9
2012	69,712	70,799	1.0
2013	73,460	71,561	1.0
2014	68,178	72,385	0.9
2015	54,491	73,115	0.7
2016	57,966	73,821	0.8
2017	63,555	74,046	0.9
2018	67,053	72,953[1]	0.9
2019	61,233	73,161	0.8
2020	67,217	73,706	0.9

[1] *The decrease in service connections in 2018 is due to incorporating a similar methodology across all divisions in not counting service connections for fire service and vacant construction locations.*



Luhdorff & Scalmanini Consulting Engineers

Total Water Supply Utilization

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 2-3

Since 2011, the annual increase in the number of new service connections has ranged from approximately 200 to 800. The number of new service connections in the last ten years is small compared to the number added each year during the 2000s when the number of new service connections ranged from 1,000 to 6,000 (**Figure 2-4**). In 2001, 52,300 service connections used 60,700 af of water, and in 2020, 73,700 service connections used 66,000 af (**Figure 2-4**). In 2001, the amount of water per service connection was almost 1.2 af per connection compared to 0.9 af per connection for 2020. This is a decrease of approximately 23 percent.

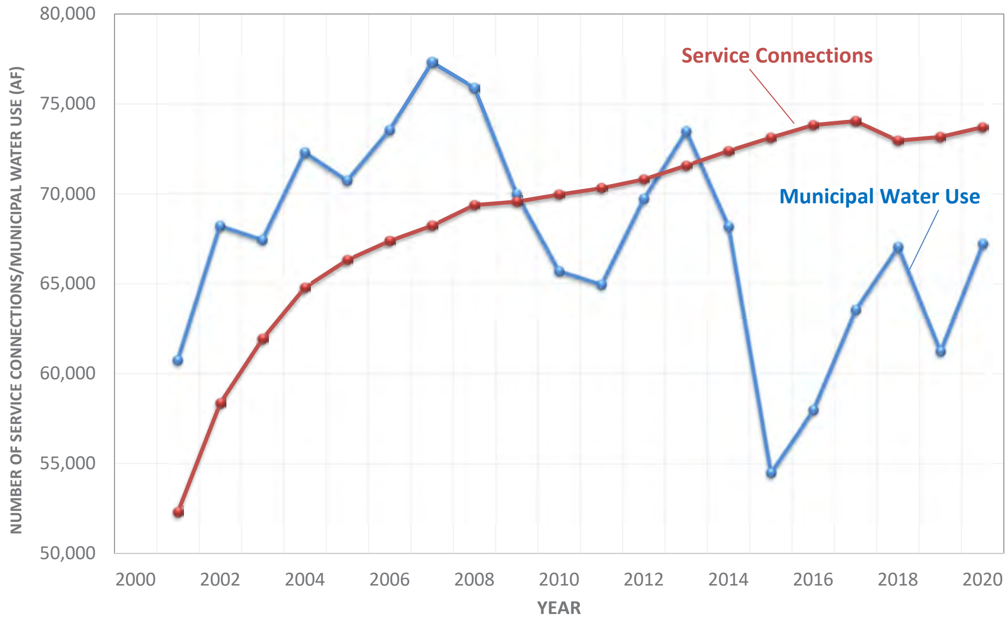


Figure 2-4. Service Connections and Municipal Water Use

2.4. Agricultural and Other Water Uses

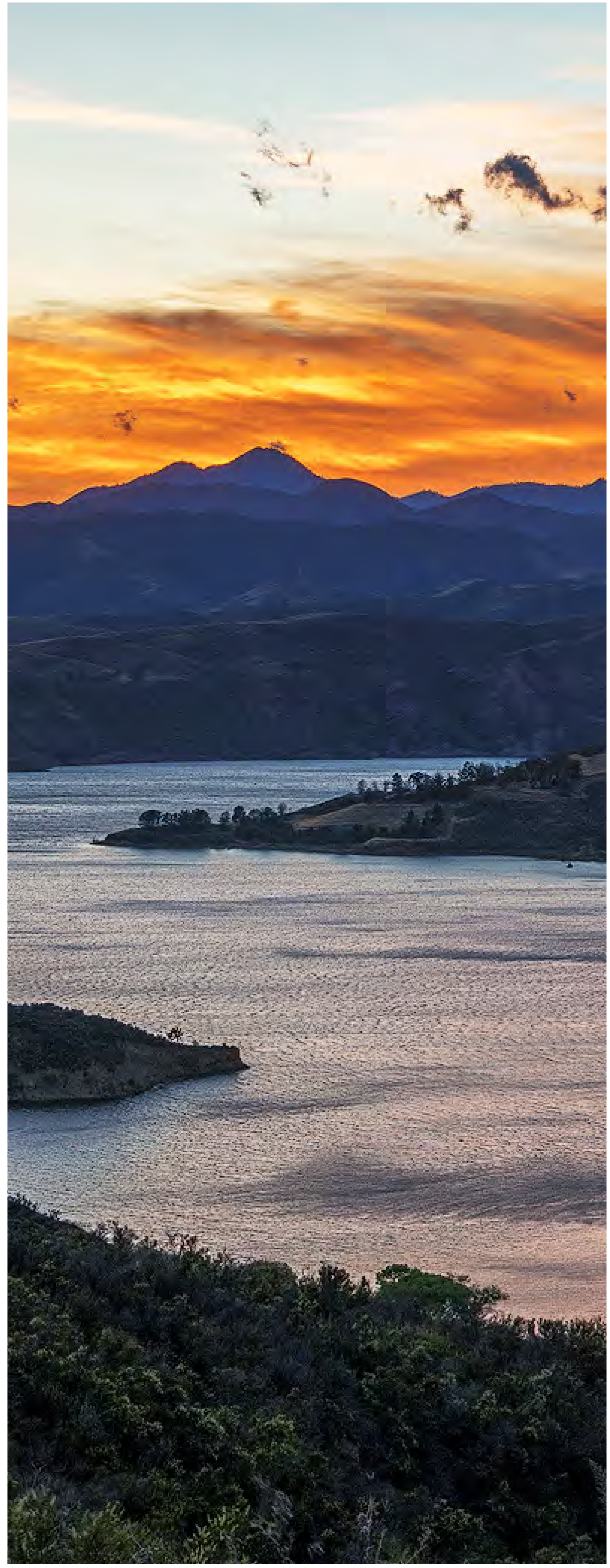
Water supply utilization for agricultural and other non-municipal uses are summarized in **Table 2-4**; detailed use by Agricultural and Other Users over a longer-term period (1980 to 2020) is provided in Appendix A. The category of Small Private Domestic, Irrigation and Golf Course Uses includes an estimated 500 afy of individual private pumping from the Alluvium. Annual water supply utilization for all agricultural and other non-municipal uses has generally remained stable until 2016 when there has been a downward trend from 2016 to 2020.

Table 2-4. Water Supply Utilization by Agricultural and Other Users (af)

Year	Five Point	Pitchess Detention Center	Whittaker-Bermite SATP	Small Private Domestic, Irrigation, and Golf Courses	Total
2011	10,667	3,226	--	1,546	15,439
2012	11,296	2,722	--	1,676	15,694
2013	12,091	2,309	--	1,751	16,151
2014	9,262	2,082	--	1,541	12,885
2015	8,868	1,768	--	1,443	12,079
2016	11,276	1,616	--	1,467	14,359
2017	10,348	1,630	--	1,460	13,438
2018	10,231	1,611	209	1,229	13,280
2019	9,790	1,560	524	1,160	13,034
2020	7,291	1,282	448	1,228	10,249

Chapter 3
Water Supplies

Prior to 1980, local groundwater extracted from the Alluvium and the Saugus Formation was the sole source of water supply in the Santa Clarita Valley. Since 1980, local groundwater supplies have been supplemented with imported SWP water supplies, augmented in 2007 by acquisition of additional supplemental water imported from the Buena Vista Water Storage District and Rosedale-Rio Bravo Water Storage District, and Yuba Accord water in 2008. Those water supplies have also been slightly augmented by deliveries from the recycled water program since 2003. This section describes the groundwater resources of the Santa Clarita Valley, SWP and other imported water supplies, and the recycled water program.

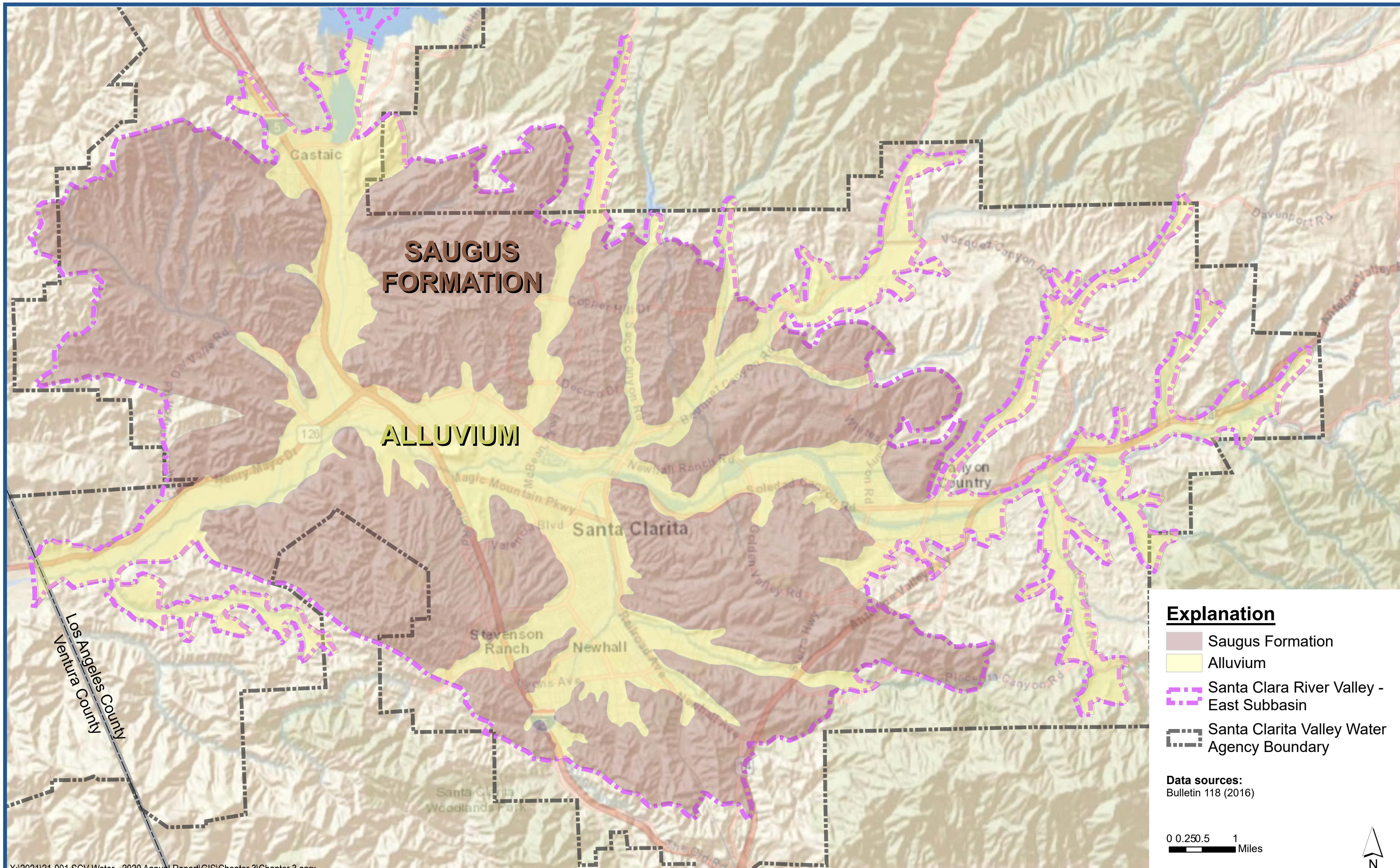


3.1. Groundwater Basin Yield

The groundwater basin underlying the Santa Clarita Valley, identified in the DWR's interim update to Bulletin 118 (DWR, 2016) as the Santa Clara River Valley Groundwater Basin, East Subbasin (Basin No. 4-4.07), comprises two aquifers, the Alluvium and Saugus Formation. The Alluvium generally underlies the Santa Clara River and its several tributaries, and the Saugus Formation underlies practically the entire Upper Santa Clara River area. The mapped extent of the Santa Clara River Valley East Groundwater Subbasin in DWR Bulletin 118 and its relationship to the extent of the SCV Water service area are illustrated in **Figure 3-1**. The mapped subbasin boundary approximately coincides with the outer extent of the Alluvium and Saugus Formation.

3.1.1. Historical Investigations

Since 1986, there have been several efforts which have evaluated and reported on the Alluvium and Saugus Formations, interpreted hydrologic conditions, and estimated sustainable yields from both formations



Luhdorff & Scalmanini
Consulting Engineers

Surficial Geology and Subbasin Extent

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-1

(Slade, 1986; Slade, 1988; Slade & Associates, 2002; CLWA, 2003; CH2M Hill, 2004; CH2M HILL, 2005; CH2M HILL and LSCE, 2005; CLWA, 2005; and LSCE and GSI, 2009). Generally, these investigations have similar conclusions for basin conditions and yield:

- Analysis of groundwater levels and production indicates that there have been no conditions that would be illustrative of groundwater overdraft.
- The utilization of operational yield (as opposed to perennial yield) as a basis for managing groundwater production would be more applicable in this basin to reflect the fluctuating utilization of groundwater in conjunction with imported water supplies.
- The operational yield of the Alluvium would typically be 30,000 to 40,000 afy for wet and normal rainfall years, with an expected reduction into the range of 30,000 to 35,000 afy in dry years.
- The operational yield of the Saugus Formation would typically be in the range of 7,500 to 15,000 afy on a long-term basis, with possible short-term increases during dry periods into a range of 15,000 to 25,000 afy, and to 35,000 afy if dry conditions continue.

These conclusions became the foundation of the initial Groundwater Operating Plan (initial Plan) first developed in 2004 after the adoption of a formal Groundwater Management Plan (GWMP) in 2003 (CLWA, 2003). The groundwater component of overall water supply in the Valley was derived from this initial Plan to meet water requirements (municipal, agricultural and other non municipal, and small individual domestic) while maintaining the basin in a sustainable condition (i.e., no long-term depletion of groundwater or interrelated surface water). This initial Plan also addressed groundwater contamination issues in the basin, all consistent with the GWMP. The initial Plan was based on the concept that pumping can vary from year to year to generally rely on increased groundwater use in dry periods and increased recharge during locally wet periods. Collectively this will assure that the groundwater basin is adequately replenished through various wet/dry cycles.

3.1.2. Current Operating Plan

The initial Plan was updated in 2008 to evaluate the yield of the basin and present a sustainable operating plan for utilizing groundwater resources from the Alluvium and the Saugus Formation under wet, normal, and dry conditions (LSCE and GSI, 2009). The Current Operating Plan summarized in **Table 3-1** is the result of an updated analysis that further assessed groundwater development potential, effects of climate change, and possible augmentation of the initial Plan. Further analysis was conducted in 2020 for the SCV-GSA's GSP which further supported the 2009 Operating Plan (GSI, 2020).

Table 3-1. Groundwater Operating Plan for the Santa Clarita Valley

Aquifer	Groundwater Production			
	Normal Years	Dry Year 1	Dry Year 2	Dry Year 3
Alluvium	30,000 to 40,000	30,000 to 35,000	30,000 to 35,000	30,000 to 35,000
Saugus	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**

The updated basin yield analysis (LSCE and GSI, 2009), completed in August 2009, had the following conclusions:

The Current Operating Plan, with currently envisioned pumping rates and distribution will not cause detrimental short- or long-term effects to the groundwater and surface water resources in the Valley and is, therefore, sustainable (**Table 3-1**)[1]. Further, local conditions in the Alluvium in the eastern end of the basin can be expected to repeat historical groundwater level declines during dry periods, necessitating a reduction in desired pumping from the Alluvium due to decreased well yield. However, those reductions in pumping from the Alluvium can be made up by an equivalent amount of increased pumping on a short-term basis in other parts of the basin without disrupting basin-wide sustainability or local pumping capacity in those other areas. For the Saugus Formation, the modeling analysis indicated that it can sustain the pumping that is embedded in the Current Operating Plan.

Several climate change models were examined to estimate the potential impacts on local hydrology in the Santa Clarita Valley. The range of potential climate change impacts extends from a possible wet trend to a possible dry trend over the long term (from 2010 through 2095). The trends that range from an approximate continuation of historical average precipitation to something wetter than that, would appear to result in continued sustainability of the Current Operating Plan, again with intermittent constraints on full pumping in the eastern part of the basin. The potential long-term dry trend arising out of climate change would be expected to decrease local recharge to the point that lower and declining groundwater levels would render the Current Operating Plan unsustainable. Ultimately it was recognized that a wide range of potential climate change scenarios produce a range of non-unique results with respect to local hydrologic conditions and associated sustainable groundwater supply. Notable in the wide range of possibilities, however, was the output that, over the planning horizon of the 2010, 2015, and 2020 UWMP (through 2050), the range of relatively wet to relatively dry hydrologic conditions would be expected to produce sustainable groundwater conditions under the Current Operating Plan.

1 A Potential Operating Plan (pumping between 41,500 and 47,500 afy from the Alluvium) would result in lower groundwater levels, failure of the basin to fully recover (during wet hydrologic cycles) from depressed storage that would occur during dry periods, and generally declining trends in groundwater levels and storage. Long-term lowering of groundwater levels would also occur in the Saugus Formation (pumping between approximately 16,000 and nearly 40,000 afy) with only partial water level recovery occurring in the Saugus Formation. Thus, the Potential Operating Plan would not be sustainable over a long-term period.

Based on the preceding conclusions, groundwater utilization generally has continued in accordance with the Current Operating Plan with the exception of recent years where groundwater pumping form the Alluvium was reduced due to the occurrence of PFAS. The recent reduction in pumping is temporary as additional water treatment measures are being implemented over the next five to ten years.

3.1.3. Sustainable Groundwater Management Act (SGMA)

The Sustainable Groundwater Management Act (SGMA) was passed by the State in 2014, which provided a state-wide framework for "management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results". SGMA requires formation of Groundwater Sustainability Agencies (GSAs) throughout much of California to sustainably manage groundwater resources. The Santa Clarita Valley GSA was formed in 2017 and is governed by a Board of Directors composed of representatives from SCV Water, the City of Santa Clarita, the County of Los Angeles, and Los Angeles County Waterworks District No. 36. By January 2022, the Santa Clarita Valley Groundwater Sustainability Agency (SCV-GSA) will develop a Groundwater Sustainability Plan (GSP) that describes basin conditions and how SCV-GSA will sustainably manage the groundwater resources in the basin.

SGMA SIX UNDESIREABLE RESULTS

- **Lowering Groundwater Levels**
- **Reduction of Storage**
- **Seawater Intrusion**
- **Degraded Quality**
- **Land Subsidence**
- **Surface Water Depletion**

The SCV-GSA's GSP will cover the Santa Clara River Valley East Subbasin (**Figure 3-1**). Its western limit is near the Los Angeles-Ventura County Line and its eastern limit is generally along Highway 14. It includes the neighborhoods of Castaic, Stevenson Ranch, Valencia, Newhall, Saugus, Canyon Country, and Val Verde. The development of the GSP included an update of the basin numerical model that utilized the Operating Plan ranges for dry, normal, and wet year groundwater pumping from the Alluvium and Saugus Formation to develop a projected water budget to 2072 under full buildout conditions as currently understood. The GSP is targeted to be adopted and submitted to the Department of Water Resources by January 2022. For information on the SGMA efforts in the Subbasin, please refer to the homepage for SCV-GSA at https://scvgsa.org.

3.2. Alluvium – General

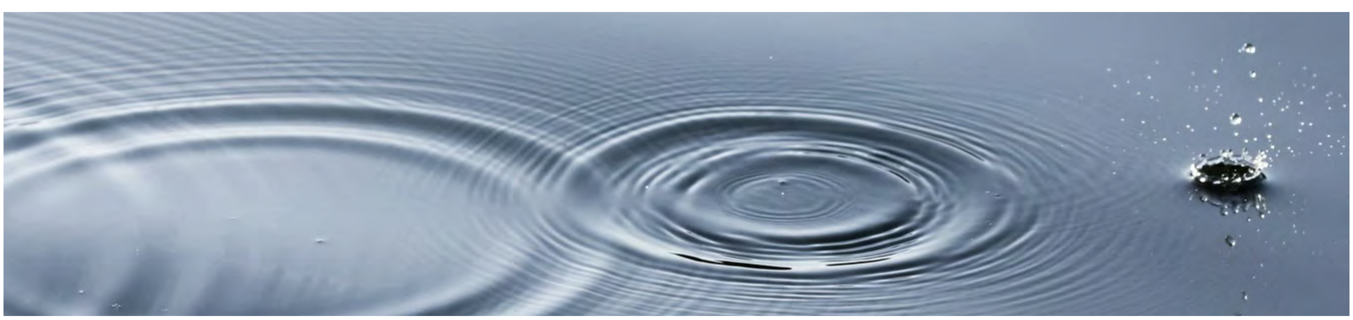
The spatial extent of the aquifers used for groundwater supply in the Valley, the Alluvium and the Saugus Formation, are illustrated in **Figure 3-1**. Geologic descriptions and hydrogeologic details related to both aquifers are included in several technical reports including Slade (1986, 1988, and 2002), CH2M Hill (2005) and LSCE (2005), the 2010 UWMP (CLWA, 2011), the 2015 UWMP (CLWA, 2016), and the 2020 UWMP (SCVWA, 2021).

Consistent with the 2001 Update Report (Slade, 2002), the 2005 Basin Yield Report (CH2M Hill and LSCE, 2005), the 2009 Updated Basin Yield Report (LSCE and GSI, 2009), and the UWMPs (2010, 2015, and 2020), the management practice of the Agency continues to be reliant on groundwater from the Alluvium for part of the overall municipal water supply, whereby total pumping from the Alluvium (by municipal, agricultural, and private pumpers) is in accordance with the Current Operating Plan, 30,000 to 40,000 afy in wet and normal years, with possible reduction to 30,000 to 35,000 afy during multiple dry years. Such operations will maximize use of the Alluvium because of the aquifer's ability to store and produce good quality water on a sustainable basis, and because the Alluvium is capable of rapid recovery of groundwater storage in wet periods.

As with many groundwater basins, it is possible to intermittently exceed a long-term average yield for one or more years without long-term adverse effects. Higher pumping for short periods may temporarily lower groundwater storage and related water levels, as has been the case in the Alluvium several times since the 1930s. However, subsequent decreases in pumping limit the amount of water level decline. Normal to wet-period recharge generally results in a rapid return of groundwater levels to historic highs. Historical groundwater level data collected from the Alluvium over numerous hydrologic cycles continue to provide assurance that groundwater elevations, if locally lowered during dry periods, recover in subsequent average or wet years. Such water level response to rainfall is a significant characteristic of permeable, porous, alluvial aquifer systems that occur within large watersheds.

In light of these historical observations, complemented by the long-term sustainability analysis using a numerical groundwater flow model in 2008, there is ongoing confidence that groundwater will continue to be a sustainable source of water supply at the rates of pumping as described in the 2009 Updated Basin Yield Report, and incorporated in the Valley's recent UWMPs. Temporary departures from pumping the Alluvium at Operating Plan ranges are currently in place as SCV Water addresses the occurrence of PFAS coupled with the long-term occurrence of a dry period since 2006. The resulting reduction in groundwater pumping from the Alluvium is expected to be temporary while SCV Water implements treatment for PFAS, and future local hydrology resumes a more representative cycle of short term wet, dry, and normal year pattern.

To address the impacts from PFAS and the long-term dry period currently being experienced, SCV Water has identified and implemented measures to ensure sustainable use of the aquifer's groundwater resources. Such measures include, but are not limited to the continuation of conjunctive use of SWP and other imported supplemental water with local groundwater, artificial recharge of the aquifer with local runoff or other surface water supplies, planned expansion of other water supplies such as recycled water, and expanded implementation of demand-side management, including conservation.



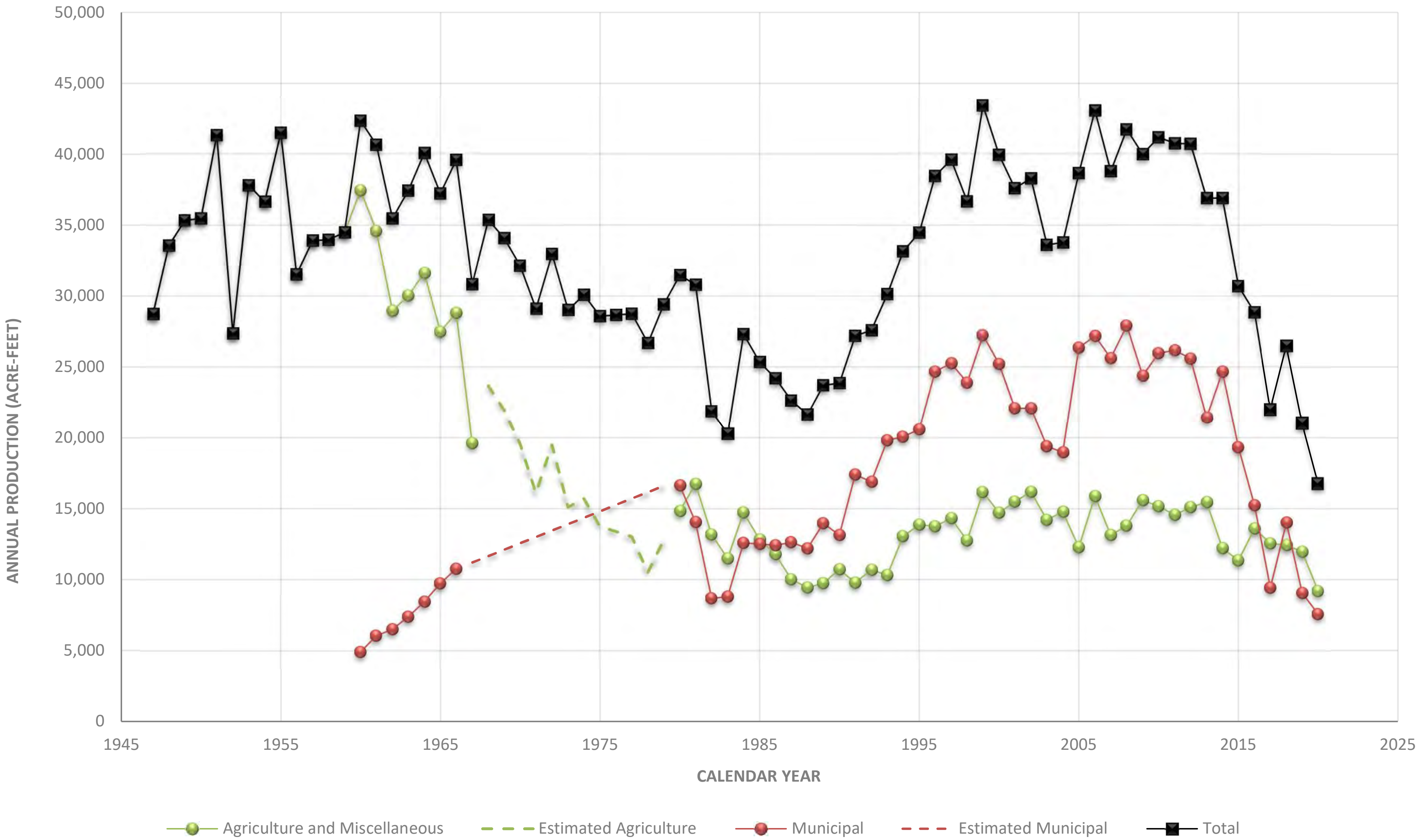
3.2.1. Alluvium – 2020 Pumpage

Total pumping from the Alluvium in 2020 was approximately 16,800 af, approximately 4,200 af less than was pumped in 2019 and below the Current Operating Plan range for a dry year. Of the total Alluvial pumping in 2020, approximately 7,600 af (45 percent) was for municipal water supply, and the balance, approximately 9,200 af (55 percent), was for agriculture and other private uses, including individual domestic uses. The decrease in groundwater pumping from the Alluvium in 2020 from 2019 was due to the loss of well capacity from PFAS mitigation and the resulting higher proportion of water demands being met by imported water supplies.

3.2.2. Alluvium – Hydrogeologic Conditions

Interpretation of longer term, historical groundwater levels and pumping indicate that the amount of groundwater pumping in 2020 was at the lower end of historically observed conditions, while recent trends in groundwater levels are consistent with dry period declines or stable conditions. Since 1980, when SWP deliveries began, there has been a change in municipal/agricultural pumping distribution toward a higher fraction for municipal water supply from approximately 50 percent to more than 65 percent of Alluvial pumpage, reflecting general land use changes in the Valley. The recent shift back to a 50 percent municipal/agricultural pumping distribution over the last few years is related to the impact of PFAS on Alluvial groundwater supplies and a resultant increase in imported municipal water use to offset the reductions in Alluvial pumping rather than to changes in land use. Ultimately, on a long-term average annual basis since the initiation of SWP deliveries in 1980, total Alluvial pumping has been approximately 32,000 afy, which is at the lower end of the range of operational yield of the Alluvium during normal years and in the middle of the range for dry years. That annual average has been slightly less over the last ten years, approximately 30,100 afy, which remains within the range of operational yield of the Alluvium on a long term annual average basis representing normal hydrologic conditions and also within the range for multiple dry year conditions. The overall historic record of Alluvial pumping is shown in Appendix A and illustrated in **Figure 3-2**.

Groundwater levels in various parts of the basin have historically exhibited different responses to both pumpage and climatic fluctuations. Since the 1960s, depending on location, groundwater levels in the Alluvium have remained fairly stable with small seasonal variations (generally toward the western end in the main part of the Valley), or have fluctuated from near the ground surface when the subbasin is full in wet periods, to as much as



Luhdorff & Scalmanini Consulting Engineers

Groundwater Production - Alluvium

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

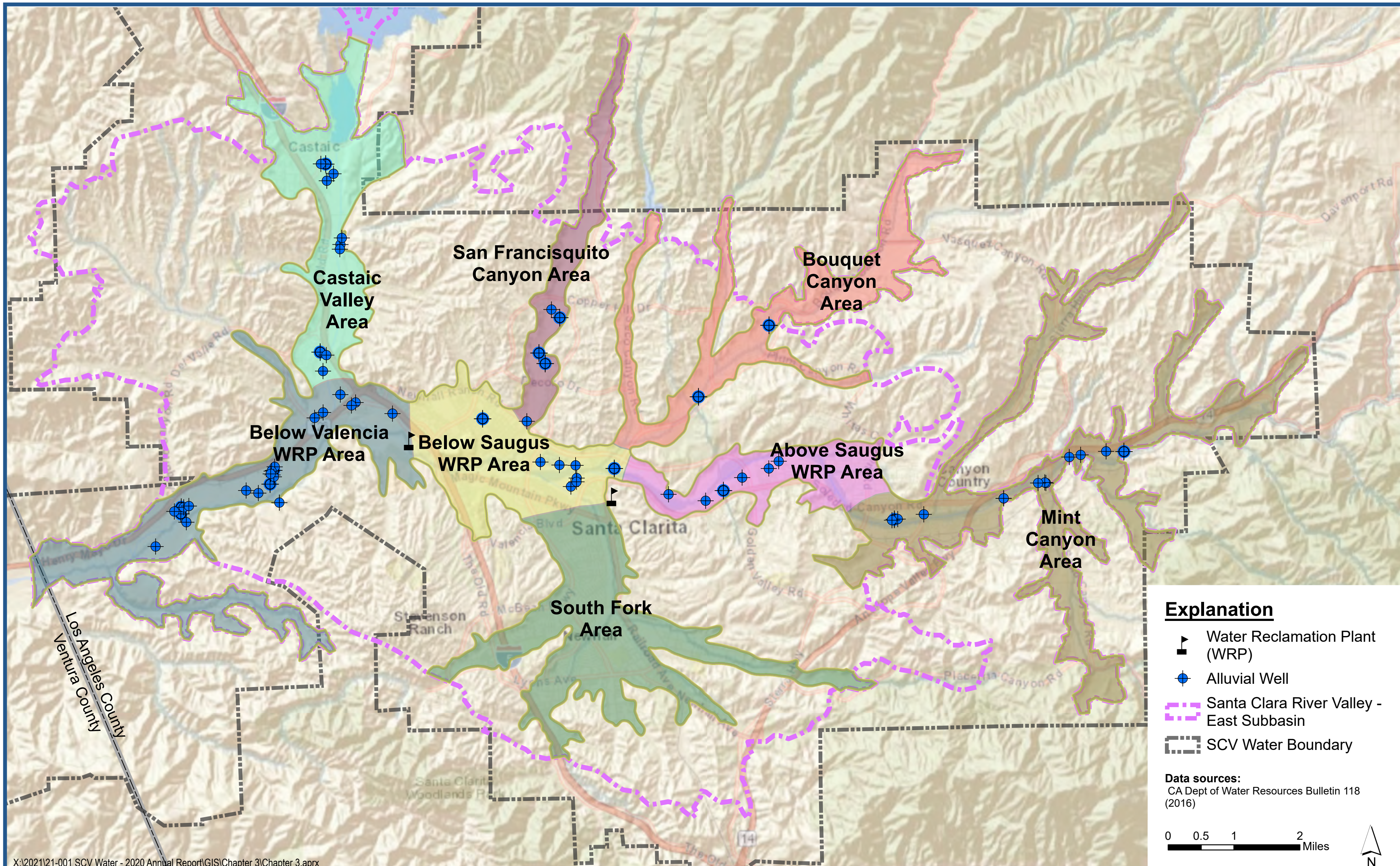
Figure 3-2

100 feet lower during intermittent dry periods of reduced recharge (generally toward the eastern end of the subbasin). When water levels are low, well yields and pumping capacities in the eastern areas are impacted due to a reduction in the saturated thickness of the Alluvium which impacts well operations. SCV Water typically responds by decreasing or ceasing pumping from the Alluvium and increasing the use of groundwater from the Saugus Formation and imported (SWP and other) supplies, as shown in Appendix A. The Agency also shifts a fraction of the Alluvial pumping that would normally be supplied by the eastern areas to areas further west, where well yields and pumping capacities remain generally constant because of smaller groundwater level fluctuations in response to wet and dry hydrologic periods.

For illustration of the various groundwater level conditions in the Valley, the Alluvial wells have been grouped into areas with similar groundwater level patterns, as shown in **Figure 3-3**. The groundwater level records from many monitored wells in the Valley have been analyzed and a representative selection of wells have been presented to illustrate groundwater conditions in the different areas of the Valley. The data from the selected wells have been organized into hydrograph form showing groundwater elevation on a time series basis as illustrated in **Figures 3-4 and 3-5**. Also shown on these plots is a marker indicating whether any calendar year had below-average rainfall, and as indicated, the Valley has experienced a long-term dry period for the most part since 2006. The plots show the range of values over time for each well and contain a sufficiently long-term record to illustrate trends over time that are typically observed in each area.

Situated along the upstream end of the Santa Clara River, the Mint Canyon area, located at the far eastern end of the Valley, and the nearby Above Saugus Water Reclamation Plant (WRP) area generally exhibit similar groundwater level responses (**Figure 3-4**) to hydrologic (local climate) and pumping conditions. Groundwater elevations in wells located in the Mint Canyon area generally show more pronounced water level recoveries during wet periods as compared to groundwater levels in the Above Saugus WRP area. These eastern parts of the Valley have historically experienced a number of alternating wet and dry hydrologic conditions during which groundwater level declines have been followed by returns to high or mid-range historic levels. Long-term pumping in the Mint Canyon area has averaged approximately 6,600 afy (1985-2020). However, since a high of over 12,000 afy in 2006, pumping in the Mint Canyon area gradually declined through 2017 and remains relatively low through 2020 at approximately 2,300 afy (**Figure 3-6**).

Historical wet and dry periods are illustrated by the groundwater level response to variations in recharge and managed Alluvial pumping. The extended dry period over the last 15 years (2006 through 2020) saw 2 cycles of water level declines on the order of 50 to 60 feet coupled with pumping reductions and subsequent water level stabilization that were followed by the partial to nearly full recovery of groundwater levels and aquifer storage during the brief wet conditions in 2010/2011 and 2019 (**Figure 3-6 and 3-4**). The continuation of reductions in pumping during 2019 and 2020 (**Figure 3-4**) has resulted in groundwater levels recovering 50 to 70 feet since 2015. It is expected that aquifer storage and groundwater levels in the Mint Canyon area will fully recover once average and/or wet conditions resume in the Valley.

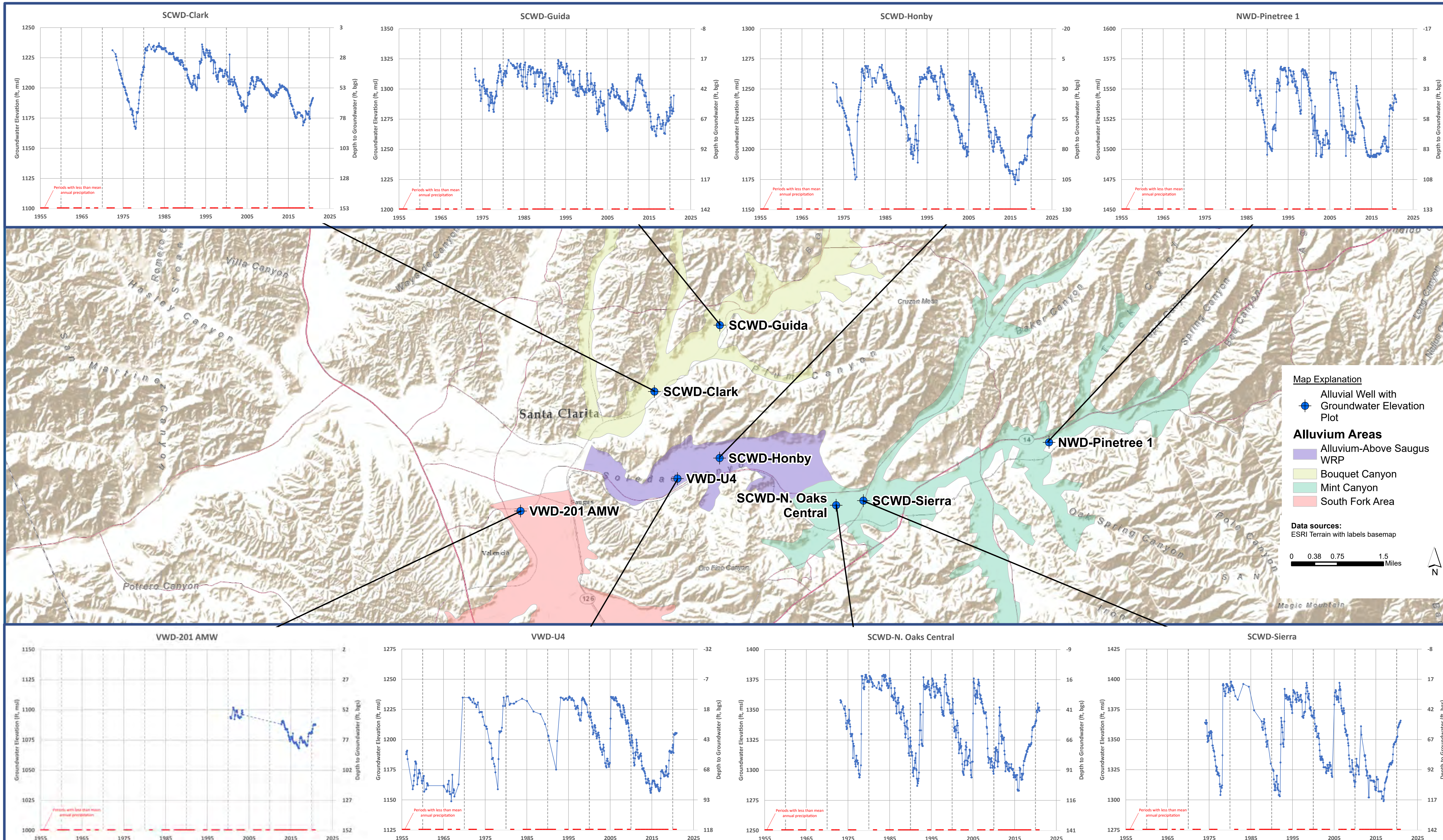


Luhdorff & Scalmanini Consulting Engineers

Alluvial Well Locations By Area

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-3

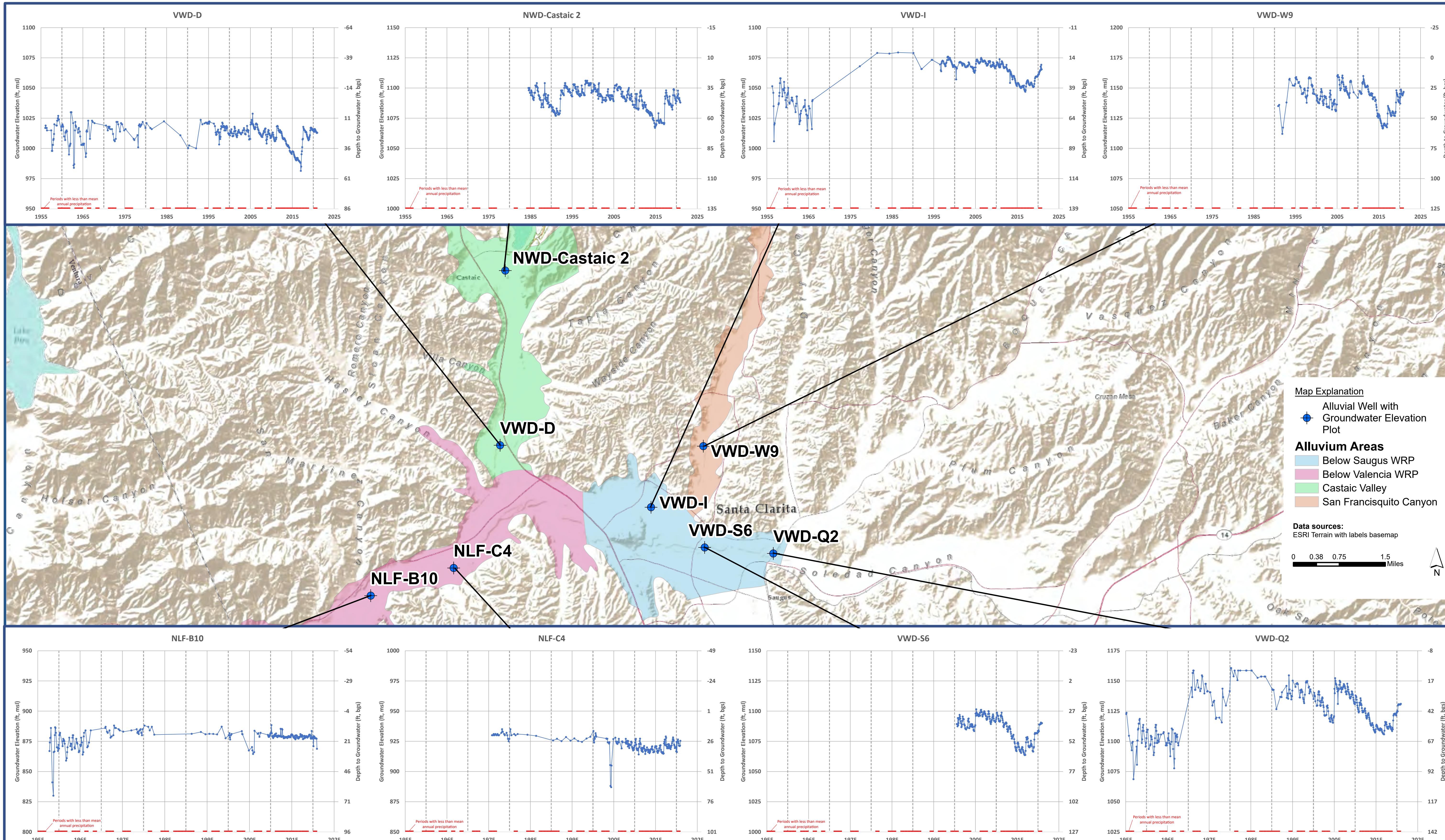


Luhdorff & Scalmanini
Consulting Engineers

Groundwater Elevations in Eastern Santa Clarita Valley Alluvial Wells

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-4

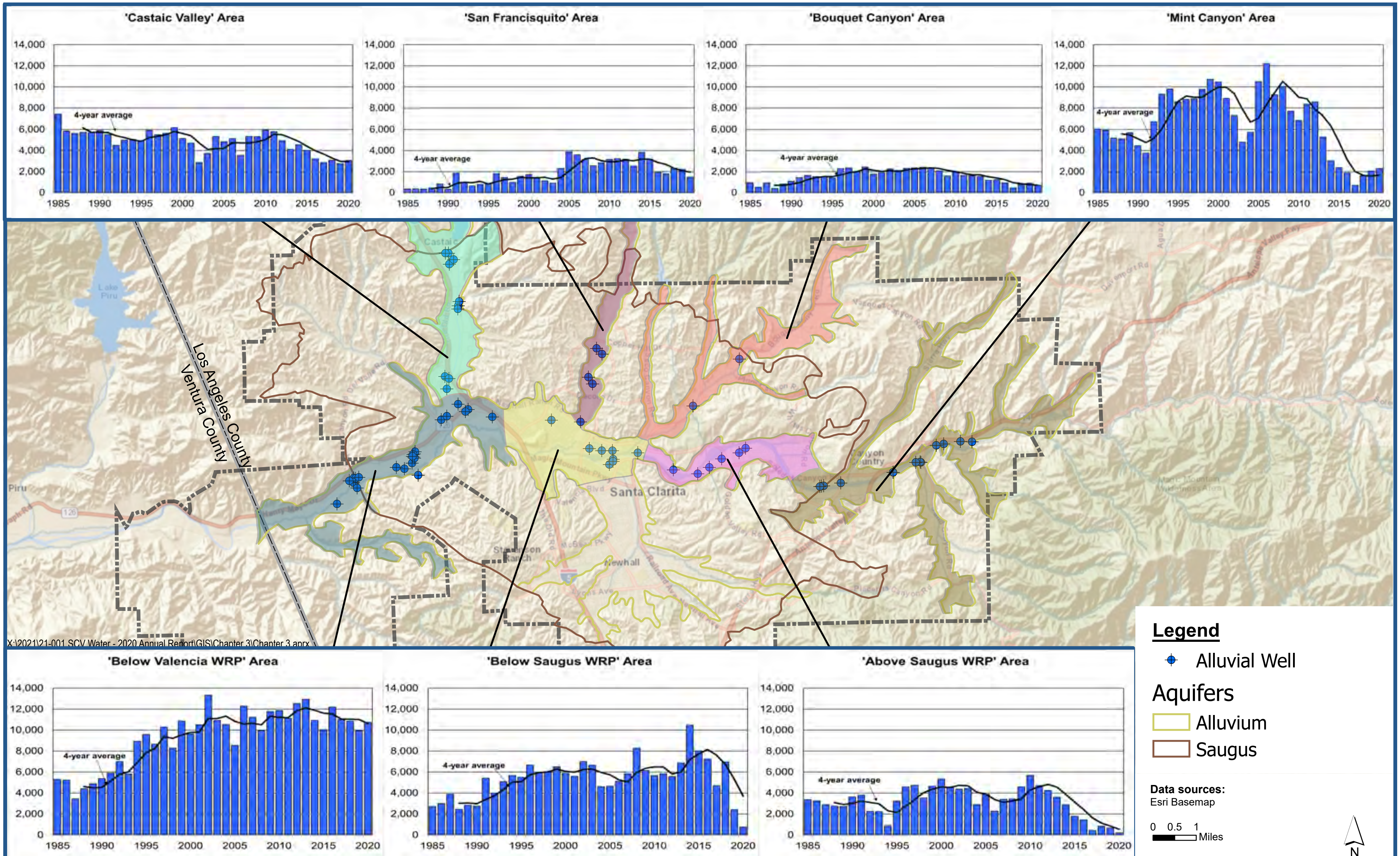


Luhdorff & Scalmanini
Consulting Engineers

Groundwater Elevations in Western Santa Clarita Valley Alluvial Wells

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-5



Luhdorff & Scalmanini
Consulting Engineers

Annual Groundwater Production from Alluvium by Area (Acre-feet)

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-6

Just west of the Mint Canyon area, the Above Saugus WRP area has shown similar hydrologic trends with the pumping fluctuating in response to wet and dry periods. However, long-term average annual pumping in the Above Saugus WRP area has been less than half the pumping rate in Mint Canyon, as shown in **Figure 3-6**, at approximately 3,175 afy (1985-2020). Since the most recent high pumping rate of almost 6,000 af in 2010, pumping in this area steadily declined through 2017 and has remained low through 2020 at 210 af mainly as a result of wells removed from service due to PFAS. Groundwater level response is similar to the Mint Canyon area in that groundwater levels are sensitive to variations in rainfall and pumping. Groundwater levels have exhibited a decline since 2005/2006 (except for a moderate rise in 2010/2011 in response to the above normalrainfall in that period) through 2014. More recently, groundwater levels in the Above Saugus WRP area show continuing recovery with 40 to 70 feet of rise from 2015 through 2020.

In the Bouquet Canyon area, groundwater levels, as represented by the Guida and Clark wells in **Figure 3-4**, are influenced by a number of factors, including groundwater pumping and recharge from rainfall, natural stream-flow in Bouquet Canyon Creek and releases from Bouquet Reservoir into Bouquet Canyon Creek. Long-term annual groundwater pumping has averaged 1,540 afy (1985-2020) and has steadily declined since 2006 from a high of approximately 2,400 af to approximately 700 af in 2020 mainly as a result of wells removed from service due to PFAS. Concurrently, groundwater elevations had been on a downward trend since the mid-1990s, but they partially recovered in response to a wet rainfall year in 2005 and again to resumed 'normal' releases of water from Bouquet Reservoir to Bouquet Canyon Creek that occurred in 2009 through 2011[2]. However, the dry conditions and a continued reduction in Bouquet Reservoir releases (related to streambed issues – not drought related) from 2012 through 2018 resulted in groundwater elevations declining an additional 30 to 45 feet to historic low levels. Since wetter conditions experienced in 2019 and a continued reduction in pumping, groundwater elevations have steadily risen by 25 to 30 feet to within mid-range historic levels by the end of 2020.

Bouquet Falls

2 Flow in Bouquet Canyon Creek is regulated by releases from Bouquet Reservoir, which is operated by Los Angeles Department of Water and Power. Per an agreement with United Water Conservation District, minimum releases from Bouquet Reservoir are specified. These releases had been maintained until a series of storms beginning in 2005 created substantial runoff and sediment deposition that altered the streambed so that even small amounts of flow overflows onto Bouquet Canyon Road. The flow carrying capacity of the creek was also impacted by an increase in sedimentation from runoff from areas burned by wildfires. Efforts to prevent flow onto the road while maintaining specified releases, restoring habitat and recharging domestic wells have not been completely successful, and therefore releases from Bouquet Reservoir have continued to be reduced during March through October since 2006 (except for 2009-2011). Currently, the Los Angeles County Department of Public Works is overseeing the Bouquet Canyon Creek Restoration Project with the primary objective to restore in-stream and riparian habitat by re-establishing creek flows. This project is still in the planning and implementation phases. (http://dpw.lacounty.gov/wrd/Projects/BouquetCanyonCreek/index.cfm).

In the South Fork Area, groundwater production from the Alluvium is minimal and there are few wells that are available for monitoring. The VWD-201 Alluvial Monitoring Well (VWD-201 AMW) has a partial groundwater level record beginning in 2000. With the available data, 25 feet of decline is observed through 2015. This is followed by a stabilization in groundwater levels through 2018 and a subsequent recovery of about 20 feet in 2019/2020.


San Francisquito Canyon Area

Wells located in the San Francisquito Canyon area and presented in **Figure 3-5** (VWD-W9) generally exhibit similar long-term groundwater level trends that respond to variations in rainfall and pumpage with seasonal declines and partial recovery in dry years or full recovery to historical highs in wet years, similar in nature to other eastern areas of the Valley. In this area, groundwater levels declined approximately 50 feet from historic highs between 2011 and 2016 and have since recovered by 30 to 40 feet. The long-term average annual pumping rate has been approximately 1,800 afy (1985-2020) with a peak of approximately 3,900 af in 2005 and 2015 (and generally a higher sustained level of annual pumping through that ten-year period). Since 2015, average annual pumping has declined to approximately 2,000 afy, with 1,500 af pumped in 2020 mainly as a result of wells removed from service due to PFAS.

In the western part and lower elevation portion of the subbasin, groundwater levels in the Alluvium respond to pumping and precipitation in a similar manner, but to an attenuated or limited extent compared to those situated in the eastern, higher elevation areas. As shown in the group of groundwater elevation hydrographs in **Figure 3-5** the magnitude of groundwater level fluctuations in the Below Saugus WRP area are less than those observed in the eastern areas of the Valley.

Wells located in the Below Saugus WRP area in **Figure 3-5** (VWD's I and Q2 wells), along the Santa Clara River immediately downstream of the Saugus Water Reclamation Plant generally show declining groundwater levels by 30 to 40 feet from 2006 through 2017, followed by a 20-foot recovery and stabilization over 2018 through 2020. Pumping in this area had been sustained at approximately 6,000 afy from the mid 1990s to the early 2000s, followed by more variable (and overall increasing) annual pumping that reached a peak of 10,500 af in 2014. Since then, pumping has steadily decreased every year (except for 2018) to a low of 750 af in 2020 mainly as a result of wells removed from service due to PFAS.

Santa Clara River

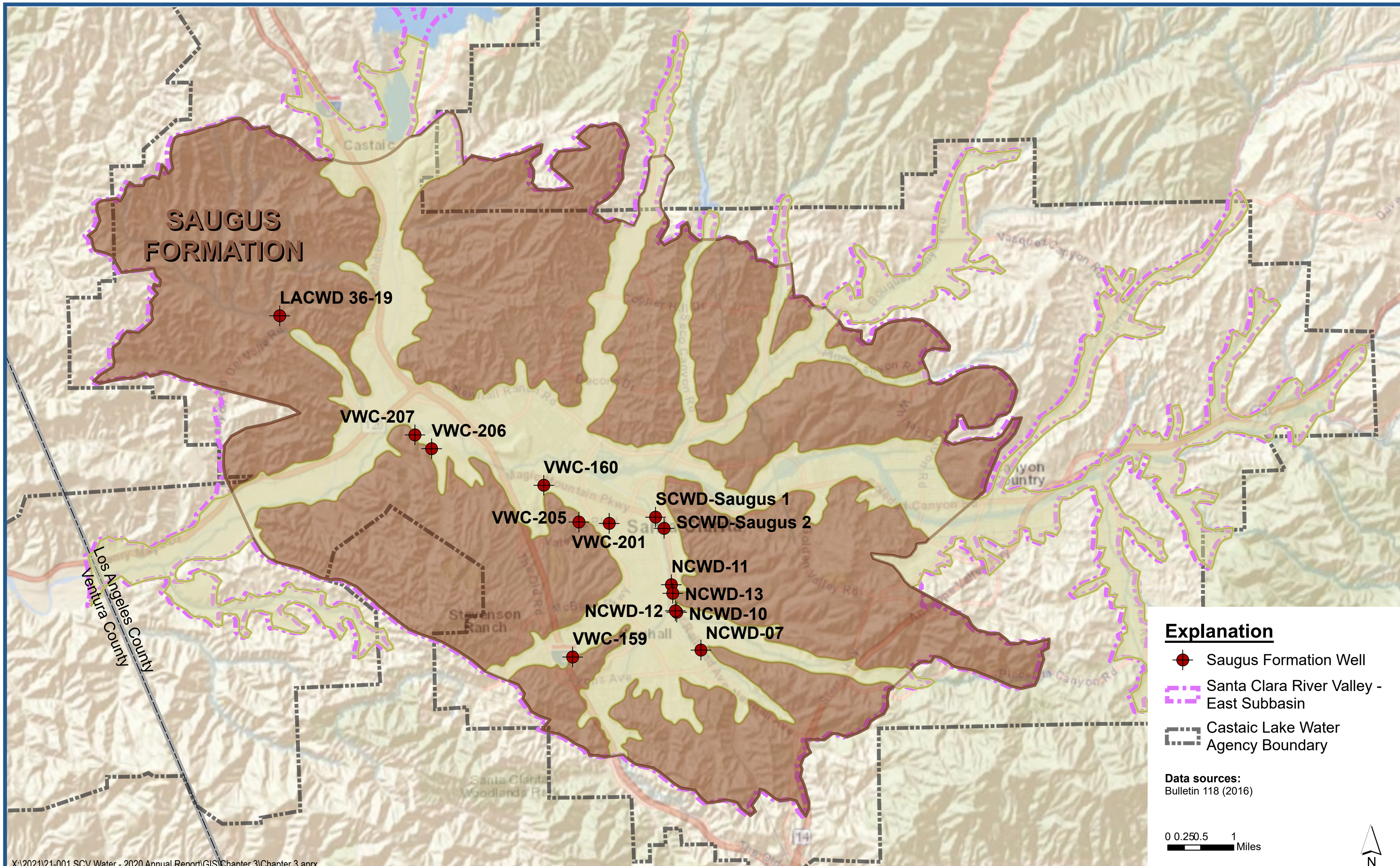
Groundwater levels in the Castaic Valley area, located along Castaic Creek below Castaic Lake, had been relatively stable since the 1950s through approximately 2011. Between 2011 and 2016, groundwater levels declined approximately 30 feet, followed by 20 to 30 feet of recovery in 2017 and stabilization near historic highs over 2018 to 2020 (**Figure 3-5**).

The long-term annual pumping rate of wells in this area has been approximately 4,850 afy (1985-2020) (**Figure 3-6**). Over most of the record since 1985, groundwater pumping had been relatively stable at about 5,300 afy through 2011 (except for a brief drop in the early 2000s). A subsequent steady decline occurred between 2011 and 2015. And over the last five years, pumping has been relatively stable again at approximately 3,000 afy.

In the area downstream of the Valencia Water Reclamation Plant (WRP), which discharges treated effluent to the Santa Clara River, groundwater pumping has averaged 9,300 afy (1985 through 2020). It increased from below 5,000 afy in the 1980s to above 13,300 afy in 2002. The pumping rate had been relatively constant at approximately 11,100 afy until 2020 when it was lowered to about 8,250 af (**Figure 3-6**). Long-term groundwater levels in this area have generally been stable and have exhibited slight response to pumping and climatic fluctuations, although from 2008 to 2016, a slight decline of approximately 10 feet has been observed in some wells in this area due to the generally dry conditions. In 2017, groundwater levels increased slightly (5 to 10 feet) and were subsequently stable through 2020 (**Figure 3-5**).

3.3. Saugus Formation – General

Wells constructed in the Saugus Formation are operated by SCV Water in a manner consistent with the Current Operating Plan and historical investigations that include the 2001 Update Report (Slade, 2002), the 2005 Basin Yield Report (CH2M Hill and LSCE, 2005), and the 2009 Updated Basin Yield Report (LSCE and GSI, 2009). Further analysis has been conducted in support of the SCV-GSA's GSP which confirmed the viability of the Operating Plan (GSI, 2020). Saugus wells are primarily located in the southern and western portions of the basin (**Figure 3-7**). The Current Operating Plan targets pumping from the Saugus Formation in the range of 7,500 to 15,000 afy in average/normal years, with planned dry year pumping of 15,000 to 35,000 afy for one to three consecutive dry years, when shortages to SWP water supplies could occur. The Current Operating Plan envisioned that high pumping during dry periods would be followed by periods of lower pumping in order to allow recovery of water levels and storage in the Saugus Formation. Maintaining the substantial volume of water in the Saugus Formation remains an important strategy to help maintain water supplies in the Santa Clarita Valley during drought periods. The ability to pump the Saugus Formation at dry year levels has been historically impaired due to perchlorate contamination issues which resulted in reduced production capacity. Both of these issues are expected to be resolved through installation of treatment and achieving containment.



Luhdorff & Scalmanini
Consulting Engineers

Saugus Formation Well Locations

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-7

3.3.1. Saugus Formation – 2020 Pumpage

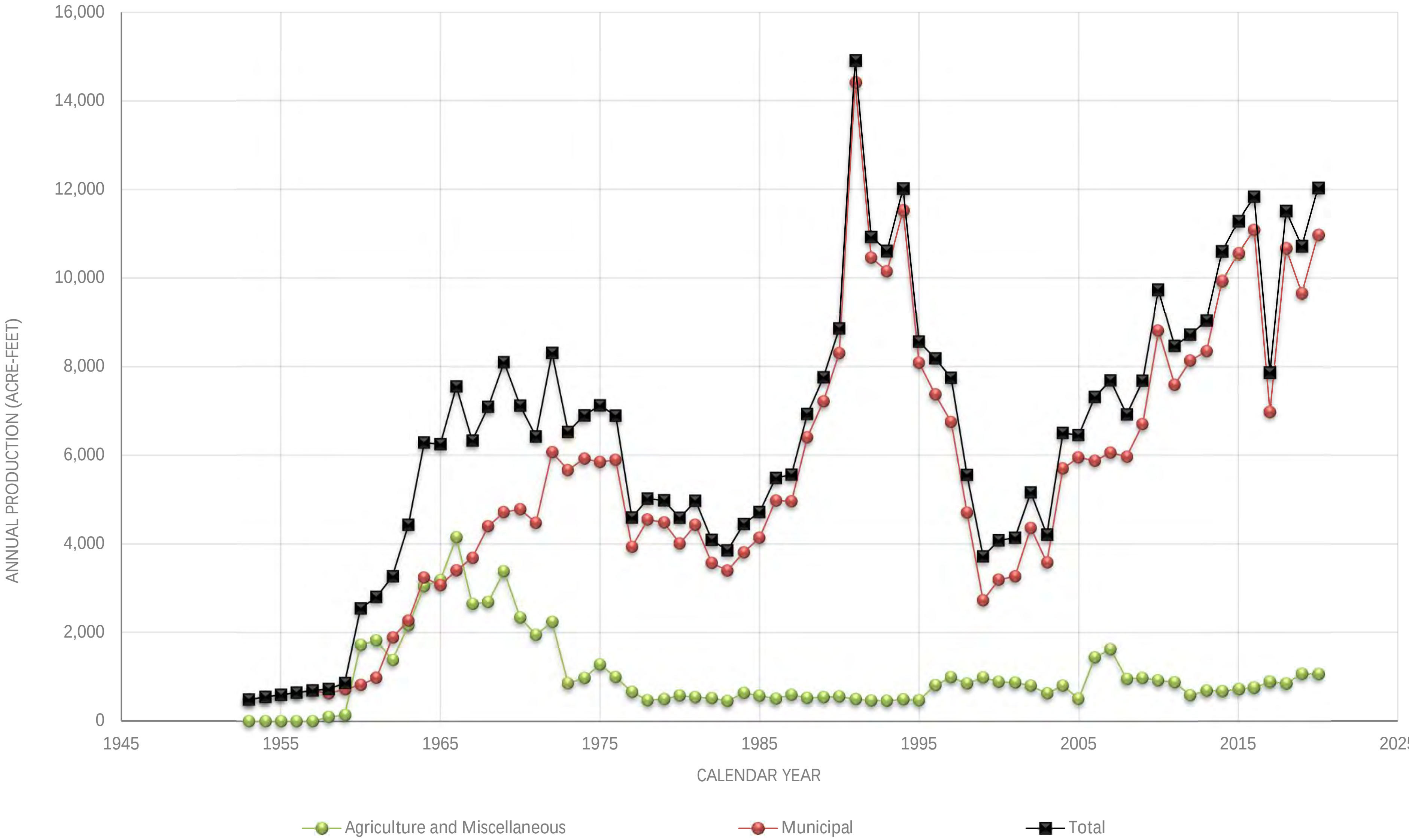
Total pumping from the Saugus Formation in 2020 was approximately 12,000 af, or approximately 1,300 af more than in the preceding year. The bulk of Saugus Formation pumping in 2020 (approximately 10,950 af) was for municipal water supply, and the balance (af) was for agricultural and other uses. This included approximately 2,800 af that were pumped from SCV Water's Saugus 1 and Saugus 2 wells. Additional pumping, not available for potable use, includes approximately 1,200 af that were pumped from V201 (as SCV Water awaits permitting by DDW) and approximately 450 af pumped from the Saugus Aquifer Treatment Plant (SATP) on the former Whittaker-Bermite Site as described herein.

3.3.2. Saugus Formation – Hydrogeologic Conditions

Since the importation of SWP water beginning in 1980, total pumping from the Saugus Formation has ranged between 3,700 afy in 1999 to a high of nearly 15,000 af in 1991. Average annual pumping from 1980 through 2020 has been approximately 7,700 af. These pumping rates remain well within, and generally at the lower end of the range of the Current Operating Plan for the Saugus Formation. The overall historic record of pumping from the Saugus Formation is illustrated in **Figure 3-8**.

Since the early 1990s, when groundwater pumping from the Saugus Formation peaked at almost 15,000 af, there was a steady decline in pumping through the remainder of that decade. Since the early 2000s, Saugus Formation pumping has been trending upward from approximately 4,000 af to 12,000 af in 2020, with the recent 5-year average at approximately 10,800 afy.

Unlike the Alluvium, which has an abundance of wells with extensive water level records, the water level data for the Saugus Formation are limited by both the geographic distribution of the wells in that Formation and the period of record. The number of wells has changed over the last several years with the addition of monitoring wells west of the Whittaker-Bermite facility in the vicinity of wells VWD-201 and VWD-160. However, the wells that do have a historical water level record that exists prior to the initiation of SWP deliveries in 1980, indicate that groundwater levels in the Saugus Formation were relatively low in the 1960s and experienced a gradual increase by the mid-1980s, followed by a decline that ended in the early 1990s. Since then, groundwater levels increased over the next 10 to 15 years and over the past 10 to 15 years have experienced a decline (**Figure 3-9**). The most recent downward trend has been experienced since 2006 through 2016 (and as seen in some wells through 2018) which also corresponds to a long-term climatic dry period. From 2018 through 2020, groundwater levels recovered about 15 to 20 feet in response to above average rainfall in 2019 and additional recharge from the Alluvium.

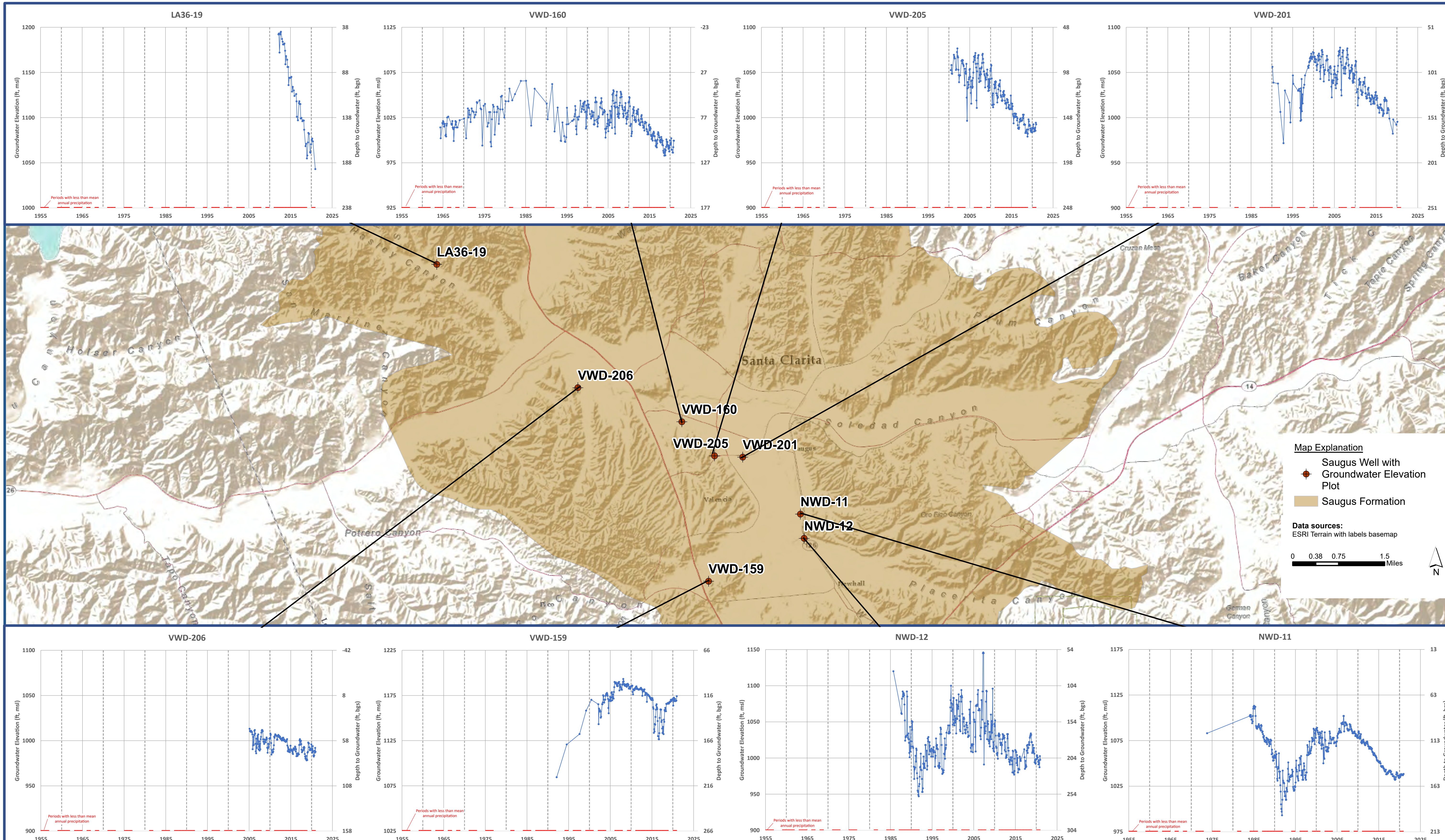


Luhdorff & Scalmanini
Consulting Engineers

Groundwater Production - Saugus Formation

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-8



Luhdorff & Scalmanini
Consulting Engineers

Groundwater Elevations in Saugus Wells

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-9

3.4. Imported Water Supplies

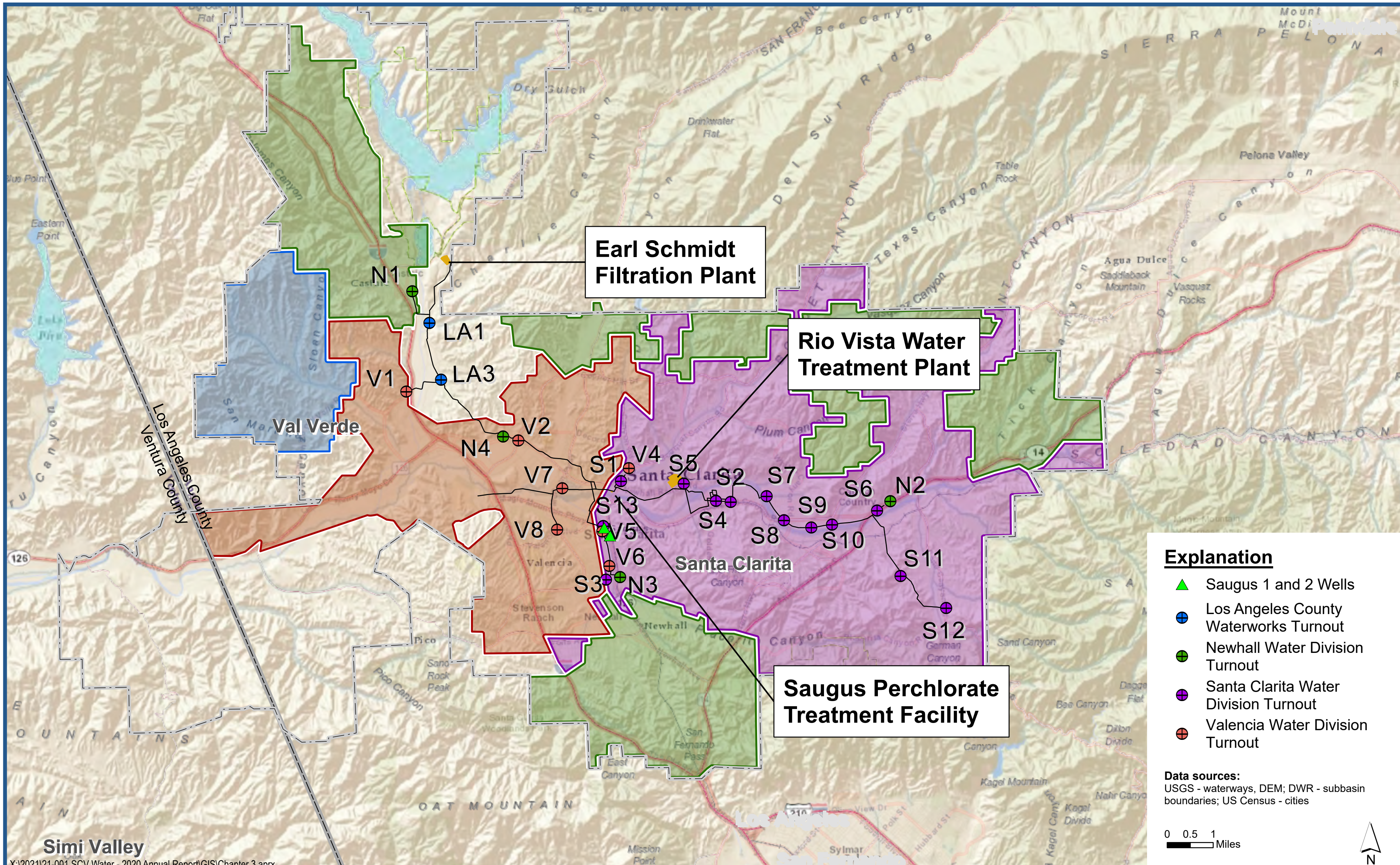
California Aqueduct

SCV Water obtains the majority of its imported water supplies from the SWP, which is owned and operated by the DWR. SCV Water is one of 29 contractors holding long-term SWP contracts with DWR. SWP water originates as rainfall and snow-melt in the Sacramento and Feather watersheds where the SWP's largest reservoir, Lake Oroville, is located. The water released from Lake Oroville flows down the Feather River, joins flows in the Sacramento River and enters the Sacramento-San Joaquin Delta. Water is diverted from the Delta into the Clifton Court Forebay, and then pumped into the 444-mile-long California Aqueduct. A portion of SWP water delivered to southern California may temporarily be stored in San Luis Reservoir, which is jointly operated by DWR and the U.S. Bureau of Reclamation. Prior to delivery to SCV Water, SWP supplies are stored in Castaic Lake, a terminal reservoir located at the end of the West Branch of the California Aqueduct.

SCV Water's service area covers approximately 195 square miles (124,800 acres), including the City of Santa Clarita and surrounding unincorporated communities. Water from the SWP and other sources located outside the Valley is treated, filtered, and disinfected at SCV Water's Earl Schmidt Filtration Plant and Rio Vista Water Treatment Plant, which have a combined treatment capacity of 122 million gallons per day. This water is delivered from the treatment plants to SCV Water and LACWD 36 through a distribution network of pipelines and turnouts. At present, SCV Water delivers water through 26 potable turnouts as schematically illustrated in **Figure 3-10**.

In 2020, SCV Water fulfilled the following major accomplishments in order to enhance, preserve, and strengthen the quality and reliability of existing and future supplies:

- continued participation in long-term water banking programs with RRBWSD and Semitropic SWRU,
- continued to participate in two-for-one exchange programs with RRBWSD, WKWD, AVEK, and UWCD,
- continued efforts in the development of a GSP under the SGMA,
- developed a Groundwater Treatment Implementation Plan to manage groundwater quality challenges related to PFAS and perchlorate in accordance with the GSP and UWMP,
- initiated the five-year update of the 2015 Urban Water Management Plan for 2020 including preparation of the first Water Shortage Contingency Plan (WSCP),
- authorized a grant application to the Bureau of Reclamation's WaterSMART Drought Response Program for Saugus Wells 3 & 4 Well Equipment and Site Improvement Project,
- authorized participation in the Delta Conveyance Project (DCP) and joined the Delta Conveyance Design and Construction Authority (DCA),
- continued with design and construction of multiple infrastructure projects including the Magic Mountain Reservoir and pipeline and extensions of recycled water distribution pipelines,
- constructed and began operation of the first PFAS Treatment Plant (N wellsite at Hart Field, and began design of two more facilities (Valley Well and Honby/Santa Clara Wells), and
- amended the Reservoir Agreement for Sites Reservoir to fund necessary planning costs.



Luhdorff & Scalmanini Consulting Engineers

Treated Water Distribution System
Santa Clarita Valley Water Agency

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-10

3.4.1. State Water Project Table A and Other Imported Water Supplies

Each SWP contractor has a specified water supply amount shown in Table A of its contract that currently totals approximately 4.1 million af. SCV Water's contractual Table A Amount is 95,200 afy of water from the SWP. The term of the SCV Water contract is through 2038. DWR released the final Environmental Impact Report (EIR) for the proposed extension in November 2018, and in January 2019, the Agency executed an amendment to extend the contract term through 2085, however, the amendment will not become effective until certain precedent conditions are met.

In addition to Table A supplies, the SWP Contract provides for additional types of water that may periodically be available, from "Article 21" water. Article 21 water is made available on an unscheduled and interruptible basis and is typically available only in above normal and wet years, generally only for a limited time in the late winter or early spring.

In early 2007, SCV Water finalized a Water Acquisition Agreement with the BV-RRB in Kern County. Under this Program, Buena Vista's high flow Kern River entitlements (and other acquired waters that may become available) are captured and recharged within Rosedale-Rio Bravo's service area on an ongoing basis. SCV Water receives 11,000 af of these supplies annually through either exchange of Buena Vista's and Rosedale-Rio Bravo's SWP supplies or through direct delivery of water to the California Aqueduct via the Cross Valley Canal. Other supplies that have been utilized in previous years include water from the Turn-Back Water Pool Program, "Article 21" water, the Yuba Accord Agreement, and "flexible storage" in Castaic Lake (up to 6,060 afy) as described in Chapter 4 and previous Water Reports. In 2008, SCV Water entered into the Yuba Accord Agreement, which allows for the purchase of water from the Yuba County Water Agency through the Department of Water Resources to 21 State Water Project contractors (including SCV Water) and the San Luis and Delta-Mendota Water Authority. This non-SWP supply is available to SCV Water in certain years depending on hydrology. Under certain hydrologic conditions, additional water may be available to SCV Water from this program.

3.4.2. 2020 Imported Water Supply and Disposition

As mentioned above, SCV Water has a contractual Table A Amount of 95,200 afy of water from SWP. As shown in **Table 3-2**, the allocation process proceeded as follows: the initial allocation for 2020 was announced as 10 percent on December 2, 2019. An allocation increase occurred on January 24, and the final allocation was announced on May 22, 2020. SCV Water's final allocation of Table A Amount for 2020 was 20 percent, or 19,040 af. Additional supply in 2020 included 9,013 af of SWP carryover from 2019, 22,957 af from the various banking and exchange programs, 284 af of Yuba Accord Water, and 11,000 af from BV-RRB. SCV Water's total available imported supply in 2020 was 62,294 af.

Table 3-2. 2020 SCVWA Imported Water Supply and Disposition (acre-feet)	
Supply	
2020 Final SWP Table A Allocation[1]	19,040
Total SWP Carryover to 2020[2]	9,013
Buena Vista/Rosedale Rio-Bravo	11,000
Rosedale Rio-Bravo WSD Banking Program	1,600
Rosedale Rio-Bravo Exchange Program	14,451
AVEK 2-for-1 Exchange Program	1,406
Semitropic SWRU	5,000
West Kern WD Exchange Program	500
Yuba Accord Water	284
Total 2020 Imported Water Supply	**62,294**
Disposition	
Service Deliveries[3]	48,196
SCVWA/DWR/Purveyor Metering[4]	632
Total Carryover to 2021[5]	13,466
Total 2020 Imported Water Disposition	**62,294**

[1] *Final 2020 allocation was 20% of contractual Table A amount of 95,200 af, which progressed as follows:*

Initial allocation, December 2, 2019	*10%*	*9,520 af*
Allocation increase, January 24, 2019	*15%*	*14,280 af*
Final allocation, May 22, 2020	*20%*	*19,040 af*

[2] *Total carryover from 2019 available in 2020 was 9,013 af. Of that amount, 3,036 af were delivered between January and March 2020 and the rest was carried over to 2021.*

[3] *Includes water used at Groundwater Treatment Facilities for blending and discharging to stormwater system.*

[4] *Reflects water loss, use by the Rio Vista Water Treatment Plant (including 385 af in 2020 for Water Conservation Garden), and meter reading differences.*

[5] *Total Table A carryover from 2020 available in 2021.*

The disposition of water by SCV Water in 2020 to various entities included delivery to SCV Water customers and LACWD 36 and sales of water to other entities is summarized in **Table 3-2**. The largest portion of supplies were delivered to SCV Water customers and LACWD 36 (48,196 af), and 632 af reflect water loss (385 af by the Rio Vista Treatment Plant for the conservation garden and the remainder from meter reading differences). The remaining 13,466 af were carried over in SWP storage for potential use in 2021.

3.4.3. Water Banking and Exchange Supplies

SCV Water maintains supply in various banking programs in the Kern Basin, and thereby has diverse supply options when needed. In 2005, then CLWA completed an agreement to participate in a long-term water banking program with RRBWSD in Kern County. This long-term program allows storage of up to 100,000 af at any one time, and with subsequent withdrawals and banking over the last 15 years, the balance at the end of 2020 is 98,810 af. SCV Water's current withdrawal pumping capacity is 10,000 afy, though up to 20,000 afy is permitted if other RRBWSD pumping capacity is available for use.

In 2011, SCV Water (formerly CLWA) executed a Two-for-One Exchange Program with RRBWSD whereby SCV Water can recover one acre-foot of water for each two acre-feet delivered (less losses). After exchanging water in 2011, 2012 and 2019, SCV Water has almost 14,500 af of recoverable water. All of this water was utilized in 2020.

Separately, SCV Water also has additional supply in Two-for-One Exchange Programs with AVEK (3,500 af) and UWCD (500 af). 1,406 af of water was utilized in 2020 from the AVEK program leaving 2,344 af for future use.

Other components of SCV Water's imported water supply reliability program include its banking agreements with Semitropic originally composed of two agreements with Semitropic whereby SCV Water's predecessor, CLWA, banked surplus Table A water supply in 2002 and 2003 (24,000 af and 32,522 af, respectively). Semitropic had recently expanded its groundwater banking program to incorporate its Stored Water Recovery Unit (SWRU). The term of the Semitropic SWRU Banking Program extends through 2035 with the option of two 10-year renewals. SCV Water may withdraw up to 5,000 afy from its account. The recoverable balance in this account at the end of 2020 stands at 40,278 af.

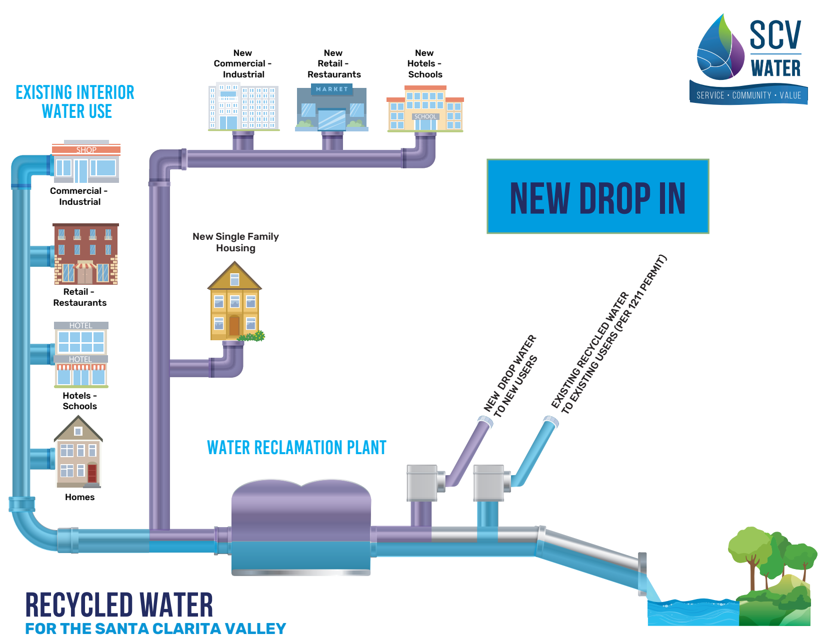
3.5. Other Water Sources

3.5.1. Recycled Water

Rosedale Rio Bravo Superior West Basins Improvements

Recycled water is an important and reliable source of additional water; the use and planned expansion of existing facilities enhances water supply reliability in that it provides an additional source of supply and allows for more efficient utilization of groundwater and imported water supplies. Deliveries of recycled water in the Valley began in 2003 for irrigation water supply at a golf course and in roadway median strips. Recently the recycled water system has been further expanded with the construction of Phases 2B and 2D which are in final stages of approval to include additional irrigation sites. In addition, a permit was renewed to allow for supply of recycled water for grading operations. Recycled water use has remained low, yet relatively constant over the last 17 years at approximately 400 afy, and in 2020, recycled water deliveries were approximately 470 af.

Recycled water is currently produced at two water reclamation plants (WRPs) operated by SCVSD: the Valencia WRP and the Saugus WRP with respective average annual production of 15,500 afy and 6,100 afy, respectively. Most of the treated effluent from these two plants is discharged to the Santa Clara River.



SCV Water is working with SCVSD and other SCV stakeholders on the best path forward to expand the Valley's recycled water resources. As a means of developing additional recycled water supplies, without increasing the diversion of recycled water flows discharged to the Santa Clara River, SCV Water has developed the New Drop Program to utilize and account for "new" recycled water flows. These additional recycled water supplies would be derived from wastewater flows generated from new residential and commercial development. The New Drop Program accounts for the increase in wastewater flows associated with new development and separates these projected wastewater flows from existing flows discharged to the Santa Clara River. As new development occurs, potential additional recycled water supplies would be quantified through calculations and measurements.

The use of recycled water under the New Drop Program does not constitute a reduction to a surface stream, specifically a reduction in flow in the Santa Clara River. As a result, a Section 1211 wastewater change petition is not required to implement the recycled water program. However, in order to utilize these recycled water supplies in accordance with SWRCB requirements, SCV Water has been working to obtain formal approvals. A Notice of Applicability under the General Order No. WQ 2016-0068-DDW, Water Reclamation Requirements for Recycled Water Use, was issued in April 2020 for SCV Water's use of recycled water from the Valencia WRP for non-irrigation uses as part of the New Drop Program. Upon review of the Title 22 Report and related project documentation, the Los Angeles Regional Water Quality Control Board and the SWRCB determined that the New Drop Program satisfies the general and specific conditions of the General Order and does not require a change of use permit under Water Code section 1211. SCV Water is also in the process of requesting expanded use of the New Drop Program recycled water from the Valencia WRP for irrigation uses, currently allowed under Order No. 97-072. An addendum to the original Title 22 Engineering Report was submitted in December 2020 for Phase 2D.

In addition, Vista Canyon Water Factory came online in 2020 and will be producing recycled water pending completion of Phase 2B construction. It is anticipated to eventually produce up to 440 afy of recycled water for new and existing users. The proposed Newhall Ranch WRP is anticipated to produce 4,200 afy at buildout, meeting more than half of the anticipated non-potable demands for the development.

An update to the 2002 Recycled Water Master Plan (RWMP) was conducted in 2016 (Kennedy/Jenks Consultants, 2016). The updated RWMP included near-term, mid-term, and long-term objectives for increasing the use of recycled water where it was economically feasible. The previous and current master plans considered various factors affecting recycled water sources, supplies, users and demands so that CLWA (now SCV Water) could develop a cost-effective recycled water system within its service area. The 2016 update remained a draft pending completion of a CEQA document.

One of the types of water reuse that was considered in the updated RWMP was groundwater replenishment, which represents an opportunity to recharge the underlying aquifer. Two recharge feasibility studies were completed for SCV Water as it advances efforts to utilize recycled water. These studies looked to evaluate the maximum potential recharge with a source of approximately 5,000 afy of recycled water from Valencia WRP. The first study looked at a recharge area in the northwest portion of the subbasin near Castaic Lake (Geosyntec, 2016) and recommended further geotechnical, geochemical, and modeling analysis of the proposed site as the initial analysis concluded that the retention time of recharged recycled water was less than the regulatory requirements.

The second study was conducted in the eastern part of the subbasin and recommended pilot studies at the proposed recharge sites to improve hydrogeologic understanding and evaluation of additional sources of diluent (Trussell and GSI, 2017). In 2020, SCV Water continued the study of potential recharge options through fieldwork evaluation at both the Castaic and eastern end locations to collect site specific geologic and infiltration information. Recharge options using potable water supply is also under evaluation due to the retention time challenges of using recycled water supplies for groundwater replenishment.

3.6. Water Quality

Water delivered by SCV Water consistently meets drinking water standards set by the United States Environmental Protection Agency (USEPA) and the State Water Resources Control Board (SWRCB) Division of Drinking Water (DDW). An annual Water Quality Report is provided prior to July 1st to all Santa Clarita Valley residents who receive water from the Water Divisions or LACWD 36. There is detailed information in that report summarizing the results of water quality testing of the groundwater and treated SWP water supplied to the residents of the Santa Clarita Valley. The report can be accessed at the following link: https://yourscvwater.com/index.php/water-quality/#waterqualityreports

3.6.1. Water Quality – General

3.6.1.1. Perchlorate

Perchlorate is a regulated chemical in drinking water. In October 2007, the California Department of Public Health (CDPH), which currently is the State Water Resources Control Board Division of Drinking Water (DDW), established a maximum contaminant level (MCL) for perchlorate of 6 micrograms per liter (µg/L). Perchlorate has been a water quality concern in the Valley since 1997 when it was originally detected in four wells operated by the purveyors in the eastern part of the Saugus Formation, near the former Whittaker-Bermite facility. In late 2002, perchlorate was detected in a fifth municipal well, in this case an Alluvial well (SCWD's Stadium Well), also located near the former Whittaker-Bermite site. Two of those wells (VWD's Well 157 and SCWD's Stadium Well) were sealed and replaced by new wells, and two wells (Saugus 1 and 2 Wells) were returned to service with treatment in January 2011. NWD's Well NC-11 has remained out of service with a portion of its capacity replaced by a combination of imported water and treated water from the Saugus Perchlorate Treatment Facility (described further below) through a SWP turnout. In early 2005, perchlorate was detected in a second Alluvial well (VWD's Well Q2) near the former Whittaker-Bermite site. Following the installation of wellhead treatment for the removal of perchlorate in the same year, the well was returned to regular water supply service. After two years of subsequent operation with no detections of perchlorate, the wellhead treatment at Q2 was removed and the well remained in active water supply service until 2019 when perchlorate was again detected at the MCL (6 µg/L). The well was taken out of service, and a treatment system for Q2 was developed in 2020 and submitted to DDW in early 2021. It is anticipated to be back online by the end of 2021.

In 2006, perchlorate was detected in low concentrations below the MCL of 6 µg/L and the analytical laboratory's Detection Limit for Reporting (less than 4.0 µg/L) in another Saugus well (NWD's Well 13), near one of the originally impacted wells. NWD-13 has remained in service with regular sampling per the DDW requirements and no subsequent detections of perchlorate. In August 2010, perchlorate was detected further down gradient in an eighth well, VWD's Well 201 that is completed in the Saugus Formation. While the initial detection was below the MCL, the well was immediately taken out of active supply service. Since then, VWD (now SCV Water) has been pursuing restoration alternatives at VWD-201. Currently, SCV Water is finalizing a permit with DDW for the treatment system, and it is anticipated that the well may be returned to service by the end of 2021. Following the detection of perchlorate in VWD Well 201 in 2010, VWD elected to minimize pumping from Well 205 through 2011, and the well was taken out of service in April 2012 when perchlorate was detected at the MCL. Treatment plans for VWD-205 are under consideration and will mostly likely be similar to those employed at VWD-201. As described in the 2015 UWMP and recently adopted 2020 UWMP, the replacement and reactivation of the impacted wells, augmented by planned and funded replacement wells, adds to the overall ability to meet the groundwater component of total water supply in the Valley.

3.6.1.1.1. Perchlorate Treatment

As part of the operation of SCV Water's Perchlorate Treatment Facilities, numerous monitoring tests are performed on a continuous basis in order to ensure the safety of the treated water leaving the facilities. Groundwater samples are collected semi-weekly at several locations, including at the wells, both at the influent and effluent water points, at the lead and lag vessels, and at several distribution locations. The samples are analyzed at different frequencies for numerous constituents, including chlorate, perchlorate, chloride, nitrate, nitrite and sulfate. In addition, samples are analyzed for microbiological growth, radiological and volatile organic compounds.

In 2020, 2,794 af of groundwater were pumped from Saugus 1 and Saugus 2. After treatment for perchlorate removal, the groundwater was blended with treated imported water and delivered to the Water Divisions through the SCV Water distribution system. To date, more than 31,400 af of groundwater have been extracted and treated from Saugus 1 and Saugus 2 in this manner, of which 29,600 af have been used for water supply[4].

In 2017, a Perchlorate Treatment Facility (PTF) was constructed at VWD-201. In November 2017, the VWD-201 PTF came online to remove perchlorate from the well and provide containment. The water being pumped through the PTF is being discharged in accordance with a National Pollutant Discharge Elimination System permit until the PTF is permitted through DDW for drinking water. This discharge necessitates the blending with imported water to lower sulfate concentrations to a permissible level. Since treatment began at VWD-201, nearly 4,300 af have been pumped and treated and discharged to the stormwater system along with approximately 5,000 af of blended imported water. The annual totals are shown in Appendix A Table 1.

The Saugus Aquifer Treatment Plant (SATP) on the former Whittaker-Bermite Facility was completed by Whittaker Corporation in June 2017 near the northern boundary of the Facility and they began operating in August 2017. The system includes 10 extraction well clusters along the western border of the Facility where groundwater is pumped from the Saugus and treated to remove perchlorate and other contaminants whereupon the water is discharged to the River (DTSC, 2019) in accordance with a National Pollutant Discharge Elimination System permit. The current permitted discharge rate from the SATP to the River is up to 1,000,000 gallons per day or 1,100 afy. The pump-and-treat system currently treats about 300 gallons of groundwater per minute, and as of the end of 2020, approximately 1,200 af have been extracted and treated (GSI Environmental, 2021). The annual totals are shown in Appendix A Table 2.

The cleanup plan for the Whittaker-Bermite site and the impacted groundwater has been coordinated among SCV Water, Whittaker Corporation, the State DTSC, and U.S. Army Corps of Engineers. These entities have also coordinated to extend targeted monitoring of the Alluvium and Saugus Formation off-site of the former Whittaker-Bermite Facility, including to locations west of Saugus 1 and 2 and

---

4 During initial operation at the SPTF in late 2010 and early 2011, Saugus 1 and 2 water was treated and discharged to the stormwater system. The annual totals are reported in Appendix Table 1 as Local Production from the Saugus Formation by SCV Water. Since early 2011, the amounts of delivered Saugus 1 and 2 water were estimated consistent with the proportions in the December 2006 MOU that established amounts to be delivered to SCWD and NWD, and those amounts are reported under Local Production from the Saugus Formation by the respective division.

VWD's Well 201 as shown in **Figure 3-11**. Off-site monitoring wells were installed near Saugus 1 and 2 between 2006 and 2009; two more were installed in 2012, and another two in 2015. Monitoring and sampling of these wells occurs on a regular basis, and the data are being evaluated to assess groundwater conditions west of Whittaker-Bermite and to monitor the effectiveness of perchlorate containment. Additionally, SCV Water's basin groundwater model that was developed for use in analyzing the basin yield and sustainability of the Current Operating Plan was also updated and used to assess off-site perchlorate containment. Onsite soil remediation was completed in 2019.

3.6.1.2. Per and Polyfluoroalkyl Substances (PFAS)

Per- and polyfluoroalkyl substances (PFAS) are a group of manmade chemicals found in a wide range of products used by consumers and industry. These chemicals are known to be resistant to grease, oil, water, and heat. There are nearly 5,000 types of PFAS that have been used in the production of stain- and water-resistant fabrics and carpeting, cleaning products, paints, fire fighting foams, cookware, food packaging and processing. The use of these chemicals has been reduced in industrial processes since the early 2000s.

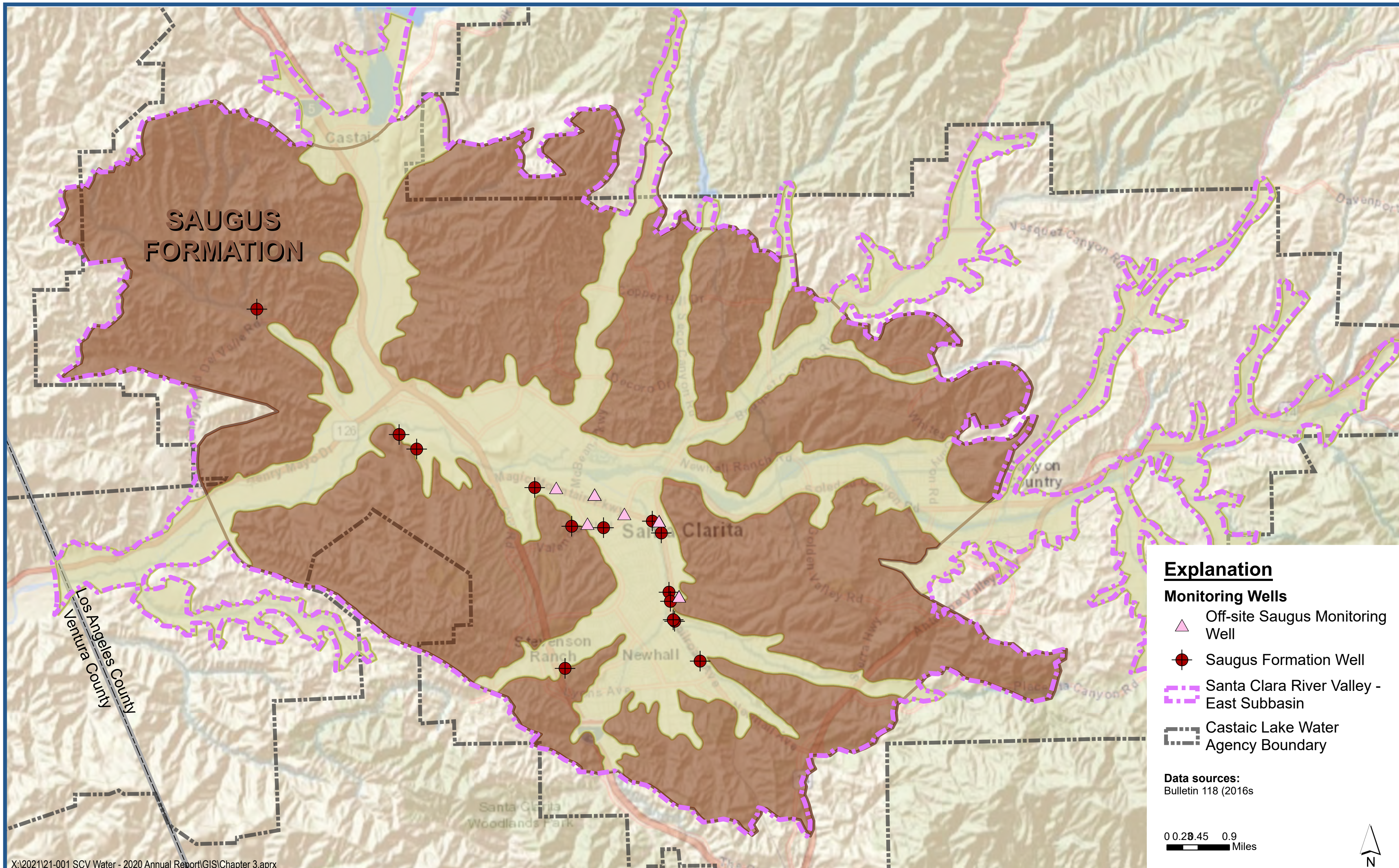
Accumulation of certain PFAS has occurred in humans and animals, and toxicological studies in animals indicate potential harmful effects, yet the understanding of those effects are still being investigated.

In 2018, DDW initially established an interim Notification Levels (NL) for Perfluorooctane sulfonate (PFOS) and Perfluorooctanoic acid (PFOA) of 13 nanograms per liter (ng/L) and 14 ng/L, and these were lowered to 6.5 ng/L and 5.1 ng/L respectively in August 2019 (SWRCB, 2020). The Response Level (RL) for PFAS (PFOS + PFOA), initially set at 70 ng/L, was lowered in February 2020 to 10 ng/L (PFOA) and 40 ng/L (PFOS). SCV Water began the required PFAS testing in May 2019, whereupon eight wells were found to exceed the interim Notification Level. One well was found to exceed the Response Level and was immediately taken out of service. Subsequent sampling in 2019 identified more wells that exceeded the NL but no more with RL exceedances.

To address these concerns, SCV Water has formed a PFAS Strike Team consisting of key SCV Water staff and expert consultants to determine next steps for treatment and other strategies. Construction of a water treatment facility at the N wells site (VWD-N, N7, N8) near the William S. Hart Baseball/ Softball League ballfields began in February 2020 and was completed in October of that year. The project provides water treatment at a rate of up to 6,250 gpm. Two additional treatment facilities are planned in the near term; one for the Valley Center well that is slated to become operational in early 2022 and another for the Santa Clara and Honby wells that is projected to become operational in mid-2022 (Kennedy/Jenks, 2021).

3.6.1.3. Volatile Organic Compounds

Organic chemical contaminants, including synthetic and volatile organic chemicals (SOC and VOCs), are byproducts of industrial processes and petroleum production, and can also come from gas stations, urban storm water runoff and septic systems. Organic compounds also include pesticides and herbicides, which may come from a variety of sources such as agriculture, urban storm water



Luhdorff & Scalmanini
Consulting Engineers

Saugus Formation Monitoring Well Locations

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

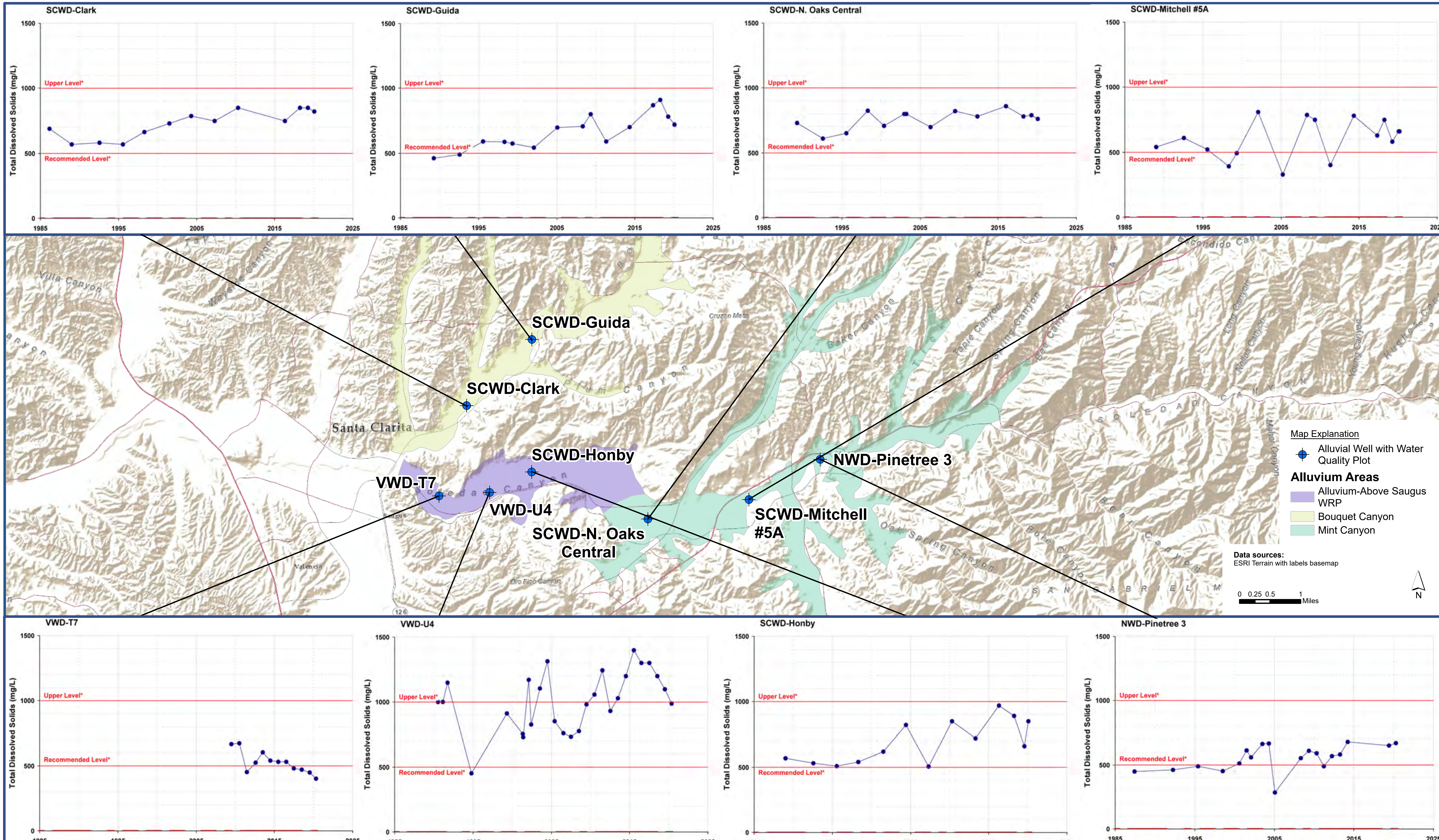
Figure 3-11

runoff and residential uses. Local supply wells are tested at least annually for VOCs (Saugus 1 and Saugus 2 and VWD-201 are tested weekly) and periodically for SOCs, and Castaic Lake water is checked annually for VOCs and SOCs. Trichloroethylene (TCE) and Tetrachloroethylene (PCE) have been detected in trace amounts in some Saugus wells, however, there have not been any VOC or SOC detections above the MCLs and therefore, the Valley's water supply complies with state and federal drinking water standards.

Because SCV Water's Water Supply Permit for Saugus 1 and 2 has a stringent operational goal that caps VOC concentrations in the distribution system to detection limits, SCV Water performed a VOC source identification study (CH2MHill, 2015). This study concluded that the likely source was the Whittaker-Bermite site or the Saugus Industrial Center. During start up and discharge of the VWD-201 Perchlorate Treatment Facility, positive results of TCE were detected slightly above the Detection Limit for Reporting (DLR). DDW has indicated that the pending water supply permit for VWD-201 will address TCE contamination.

3.6.2. Groundwater Quality – Alluvium

Groundwater quality is a key factor in assessing the Alluvium as a source for municipal and agricultural water supply. Groundwater quality details and long-term conditions, examined by integration of individual records from several wells completed in the same aquifer materials and in close proximity to each other, have been discussed in previous annual Water Reports and in the 2015 and 2020 UWMP's. Historical groundwater quality, including available 2020 data, is illustrated in **Figures 3-12 and 3-13**. These figures show historical total dissolved solids (TDS) concentrations, which is a measure of the amount of dissolved minerals and salts in water expressed in milligrams per liter (mg/L) as a unit of measure. These plots include the historical records for wells with water quality that are representative of each area of the Valley, the DDW Secondary MCL (which are the aesthetic-based standards "Recommended and Upper Levels") for reference. Concentrations of TDS generally respond to wet periods by exhibiting a downward trend, followed by an increasing trend during dry periods.

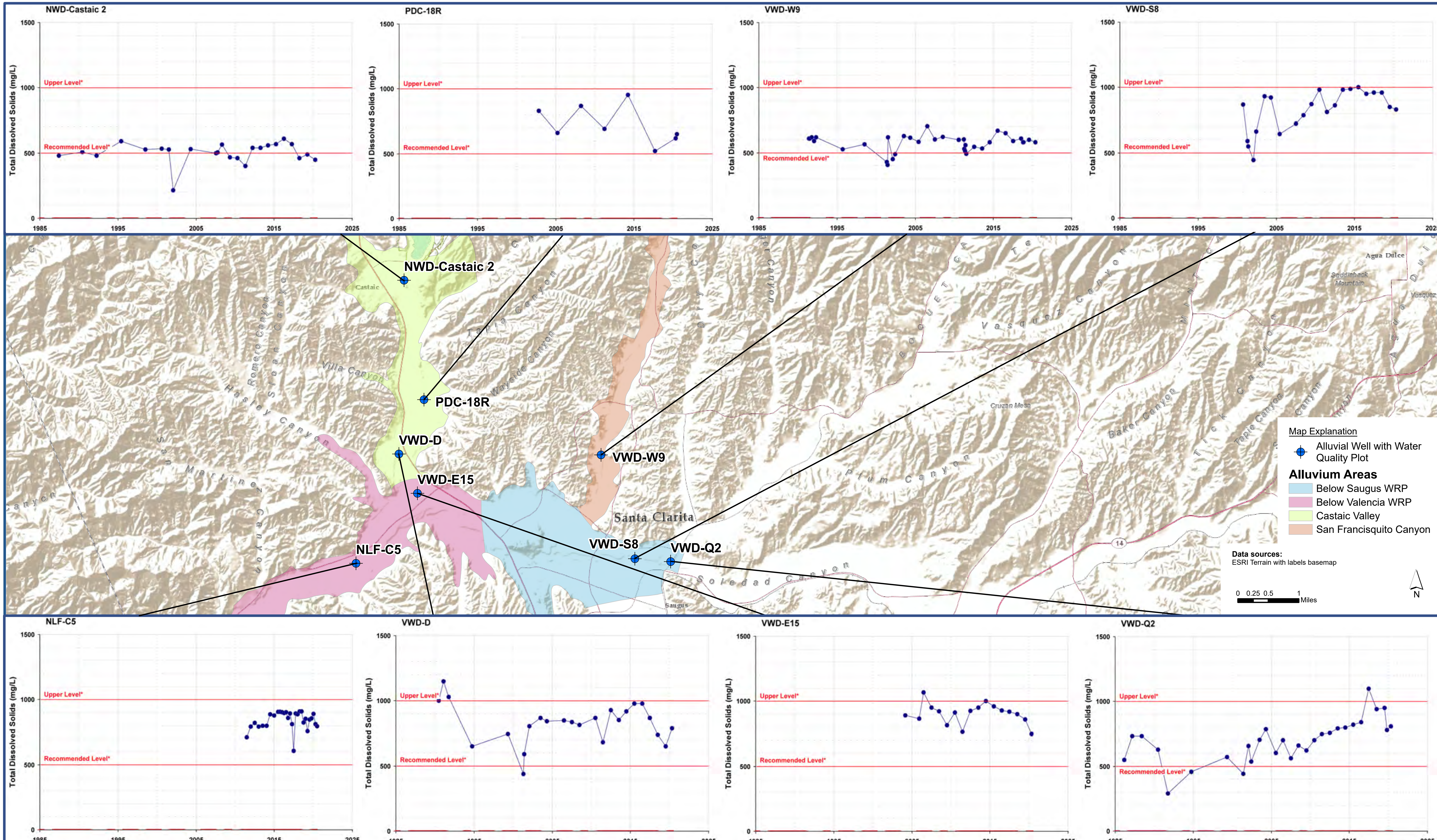


Luhdorff & Scalmanini Consulting Engineers

Groundwater Quality in Eastern Santa Clarita Valley Alluvial Wells

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-12



Luhdorff & Scalmanini
Consulting Engineers

Groundwater Quality in Western Santa Clarita Valley Alluvial Wells

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-13

In the Mint Canyon and Above Saugus WRP areas (**Figure 3-12**), TDS concentrations have experienced a long-term stable trend over the past 30 years with variation in TDS concentrations during wet and dry periods that range from 300 to 800 mg/L. Generally, TDS concentrations are between the recommended and upper levels of the TDS secondary MCL. VWD-U4 has exhibited short-term increases above the secondary MCL upper level, but concentrations have decreased over the past five years. It is also notable that this well is completed to a depth in the alluvium that is near the contact with the Saugus Formation. In 2020, TDS ranged from 400 to 1,000 mg/L.

In Bouquet Canyon, variations in historical TDS concentrations are more gradual than those in Mint Canyon and may be correlated with periods of flow in Bouquet Canyon Creek (**Figure 3-12**). TDS concentrations in Bouquet Canyon have ranged from approximately 400 to almost 900 mg/L historically. In 2020, TDS concentrations were within the historical range for both SCWD's Guida well and Clark well with values of 720 mg/L and 820 mg/L, respectively.

TDS concentrations in the western areas of the Valley exhibited similar patterns and responses to wet and dry periods as those observed in the eastern portions of the Valley (**Figure 3-13**). TDS concentrations in San Francisquito Canyon and Below Saugus WRP areas historically have ranged from approximately 300 to 1,100 mg/L. In 2020, TDS concentrations were within historical ranges and ranged from approximately 600 to 800 mg/L.

In Castaic Valley and Below Valencia WRP areas, TDS concentrations have historically ranged between 300 to 1,100 mg/L. At times, variations in TDS concentrations appear to be related to wet and dry periods along with discharge from Castaic Lake. In 2020, TDS concentrations ranged between 450 to 800 mg/L, which remain within the historic range.

In summary, water quality in the Alluvium exhibits no long-term increasing trends. TDS concentrations in 2020 are within historical ranges. There have been periodic fluctuations in some parts of the basin, where groundwater quality has generally inversely varied with precipitation and stream-flow. The fluctuations often occur during dry and wet periods when recharge decreases during dry periods, resulting in increased salinity and higher amounts of recharge during wet periods which results in decreased salinity. In 2020, of the 33 sampled alluvial wells throughout the Valley, none were found to be in exceedance of the DDW Secondary MCL upper level for TDS. Testing by SCV Water in accordance with DDW requirements demonstrates that groundwater with the exception of occasional variances above the secondary MCL for TDS, meets acceptable drinking water standards.

The presence of long-term consistent water quality patterns, although intermittently affected by wet and dry cycles, supports the conclusion that the Alluvium remains a viable ongoing water supply source in terms of groundwater quality even with short-term exceedances in a few of the wells.

3.6.3. Groundwater Quality – Saugus Formation

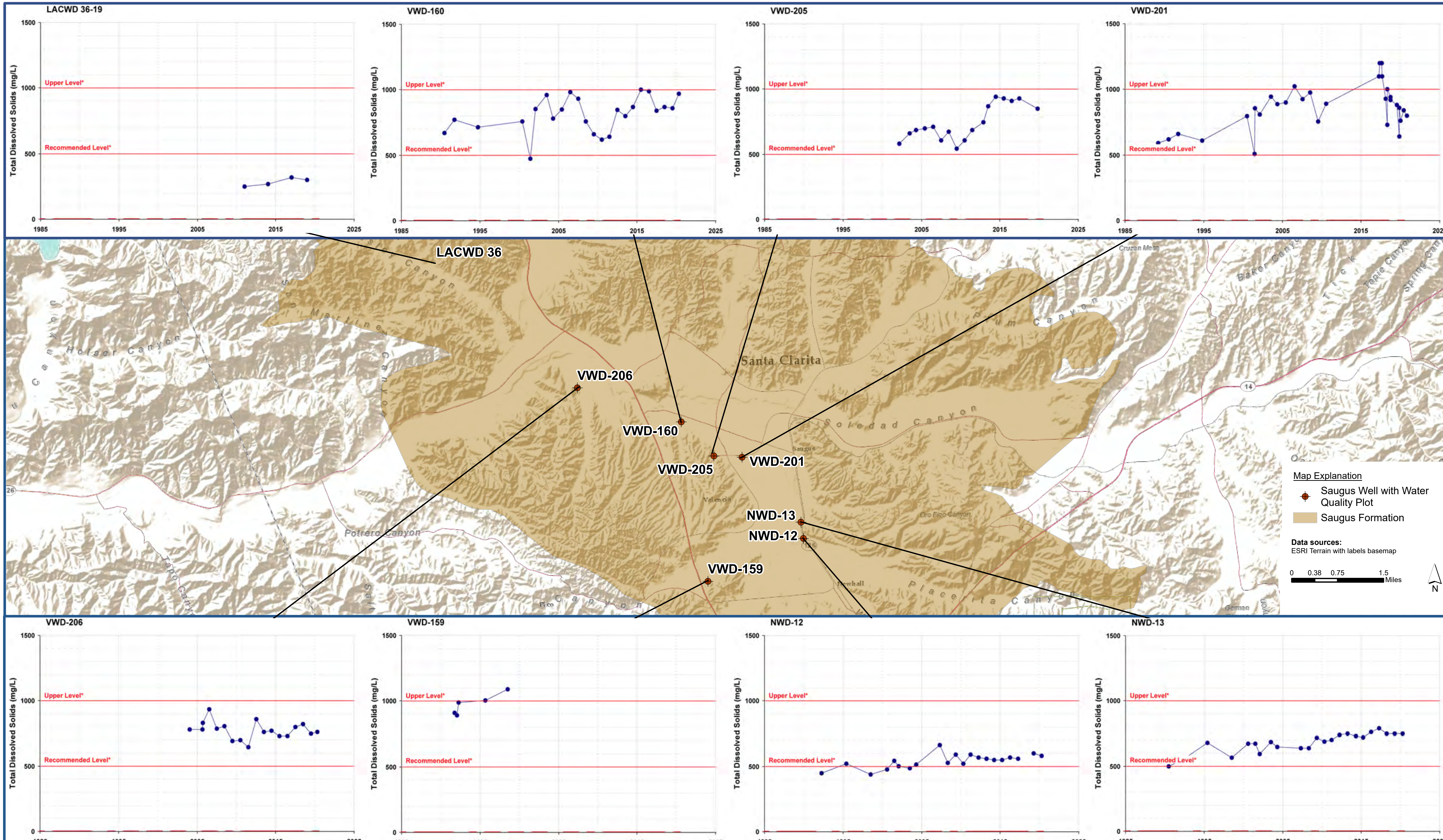
As discussed above for the Alluvium, groundwater quality is also a key factor in assessing the Saugus Formation as a source for municipal and agricultural water supply. As with groundwater level data, long-term Saugus Formation groundwater quality data are not sufficiently extensive to permit any sort of basin-wide analysis or assessment of pumping-related impacts on quality. However, integration of individual records from several wells has been used to examine general water quality trends. Based on those records, water quality in the Saugus Formation has not historically exhibited the recharge-related fluctuations seen in the Alluvium. Based on available data over the last 50 years, groundwater quality in the Saugus Formation has exhibited stable to slightly increasing trends in TDS concentrations as illustrated in **Figure 3-14**. Beginning in 2000, several wells within the Saugus Formation have exhibited an increase in TDS concentrations, similar to short-term changes in the Alluvium, possibly as a result of decreased recharge to the Saugus Formation from the Alluvium. Since 2006, however, these concentrations had been steadily declining through 2010, followed by a stable trend in NWD-12 and separately an increasing trend (through 2016) and then a decreasing trend through 2020 in the other Saugus wells. However, VWD-160 was the single Saugus well that increased in 2020, but it remained below the Secondary MCL upper level. TDS concentrations in the Saugus Formation remain within the range of historic concentrations and below the Secondary MCL upper level. Groundwater quality within the Saugus Formation will continue to be monitored to ensure that degradation to the long-term viability of the Saugus Formation as a component of overall water supply does not occur.

3.6.4. Imported Water Quality

SCV Water operates two surface water treatment plants, the Earl Schmidt Filtration Plant located near Castaic Lake and the Rio Vista Water Treatment Plant located in Saugus. SCV Water produces water that meets drinking water standards set by the USEPA and DDW. SWP water has different aesthetic characteristics than groundwater with lower TDS concentrations of approximately 250 to 400 mg/L.

Historically, the SWP delivered only surface water from northern California through the Sacramento-San Joaquin River Delta. However, with the increase in conjunctive use and integrated water supply planning to minimize impacts on available water supplies during periods of drought, SCV Water and other SWP contractors began "water banking" programs where SWP water could be stored or exchanged during wet years and withdrawn in dry years. During the dry-year periods, a greater portion of water in the SWP includes banked water supplies. The banked water has met all water quality standards established by DWR under its pump-in policy for the SWP.

Sacramento San Joaquin Delta



Luhdorff & Scalmanini
Consulting Engineers

Groundwater Quality in Saugus Wells

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

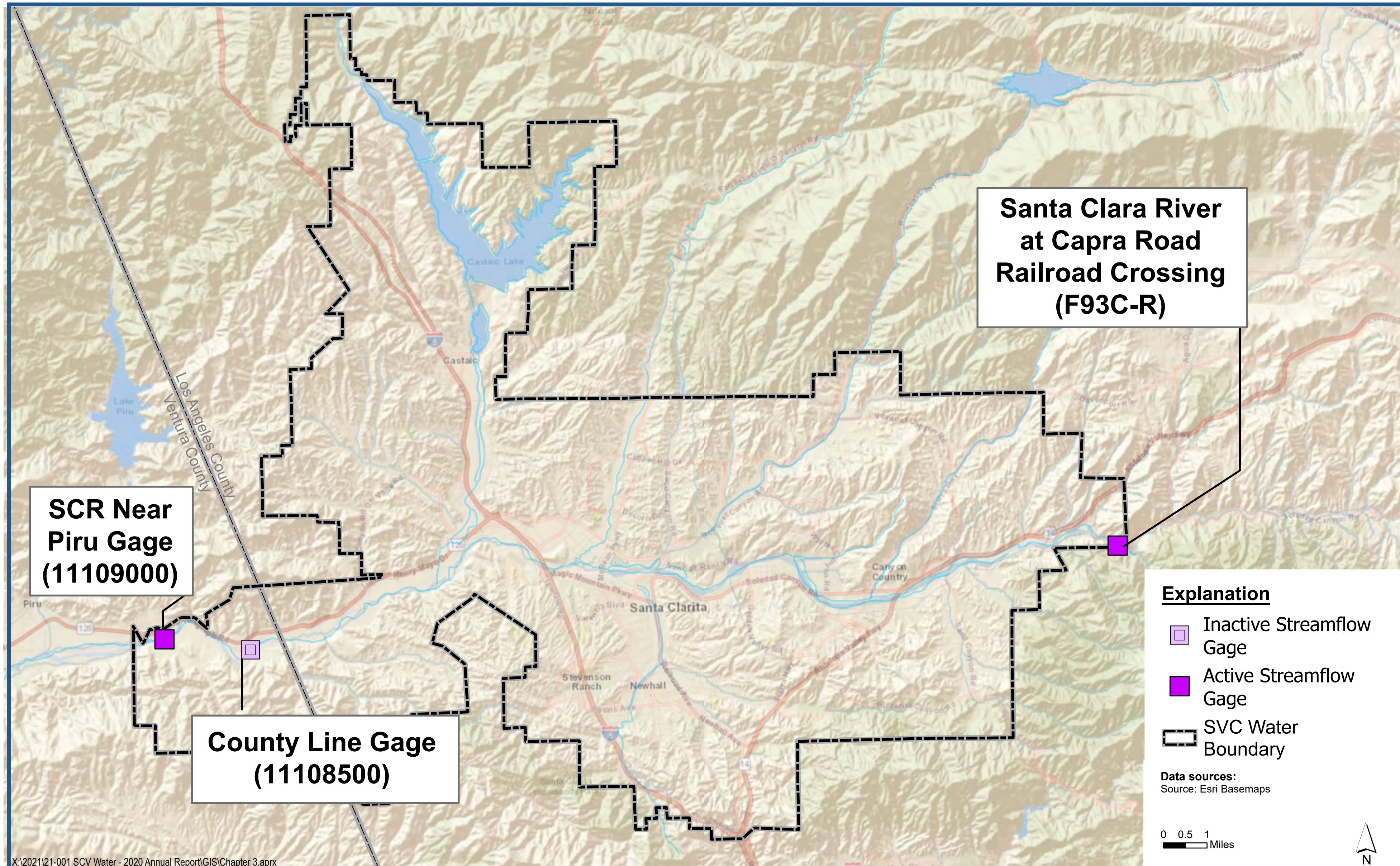
Figure 3-14

3.7. Santa Clara River

The Memorandum of Understanding (MOU) between the SCV Water and the United Water Conservation District (UWCD), which manages surface and groundwater resources in seven groundwater subbasins in the Lower Santa Clara River Valley Area, was a significant accomplishment when it was initially prepared and executed in 2001 and later updated and renewed in 2018. The MOU initiated a collaborative and integrated approach to data collection; database management; groundwater flow modeling; assessment of groundwater basin conditions, including determination of basin yield amounts; and preparation and presentation of reports. The preparation and presentation of reports included continued annual reports such as this one for current planning and consideration of development proposals, and more technically detailed reports on geologic and hydrologic aspects of the overall stream-aquifer system.

On occasion, public comments have been raised on whether use and management of groundwater in the Santa Clarita Valley have adversely impacted surface water flows into Ventura County. Part of the groundwater modeling work has addressed the surface water flow question as well as groundwater levels and storage. While the sustainability of groundwater has logically derived primarily from projected long-term stability of groundwater levels and storage, it has also derived in part from modeled simulations of surface water flows and stream-aquifer interactions from groundwater pumping in the central and western portions of the Valley. In addition, the long-term history of groundwater levels in the western and central part of the Valley, as illustrated in **Figures 3-4 and 3-5**, supports the modeled analysis and suggests that groundwater levels have not declined to a degree in which recharge from the Santa Clara River has impacted stream-flow to Ventura County.

Historical annual stream-flow in the Santa Clara River, into and out of the Santa Clarita Valley has been monitored at an upstream gage at Santa Clara River above Lang Railroad Station at Lang gage and Capra Road Railroad Crossing and two downstream gages (County Line and SCR at Piru) (**Figure 3-15**). The Lang gage (F93B-R) shows a wide range of average annual stream-flow into the basin; however, the data from the gage has not always been accurate because the gage's location limited the ability to record stream-flow. In 2010, Los Angeles County Department of Public Works (LADPW) removed the transducer that previously collected stream-flow data due to operational problems with the transducer and the location of the gage not being adequate to allow for accurate stream-flow measurements. Between 2010 and 2012, LADPW has conducted manual measurements of stream-flow, however, the measurements were not frequent enough to account for the range of stream-flows that likely occurred. In June 2013, LADPW relocated the Lang gage to a more suitable location 150 feet upstream on the Santa Clara River, and it was renamed Capra Road Railroad Crossing (F93C-R).



Luhdorff & Scalmanini
Consulting Engineers

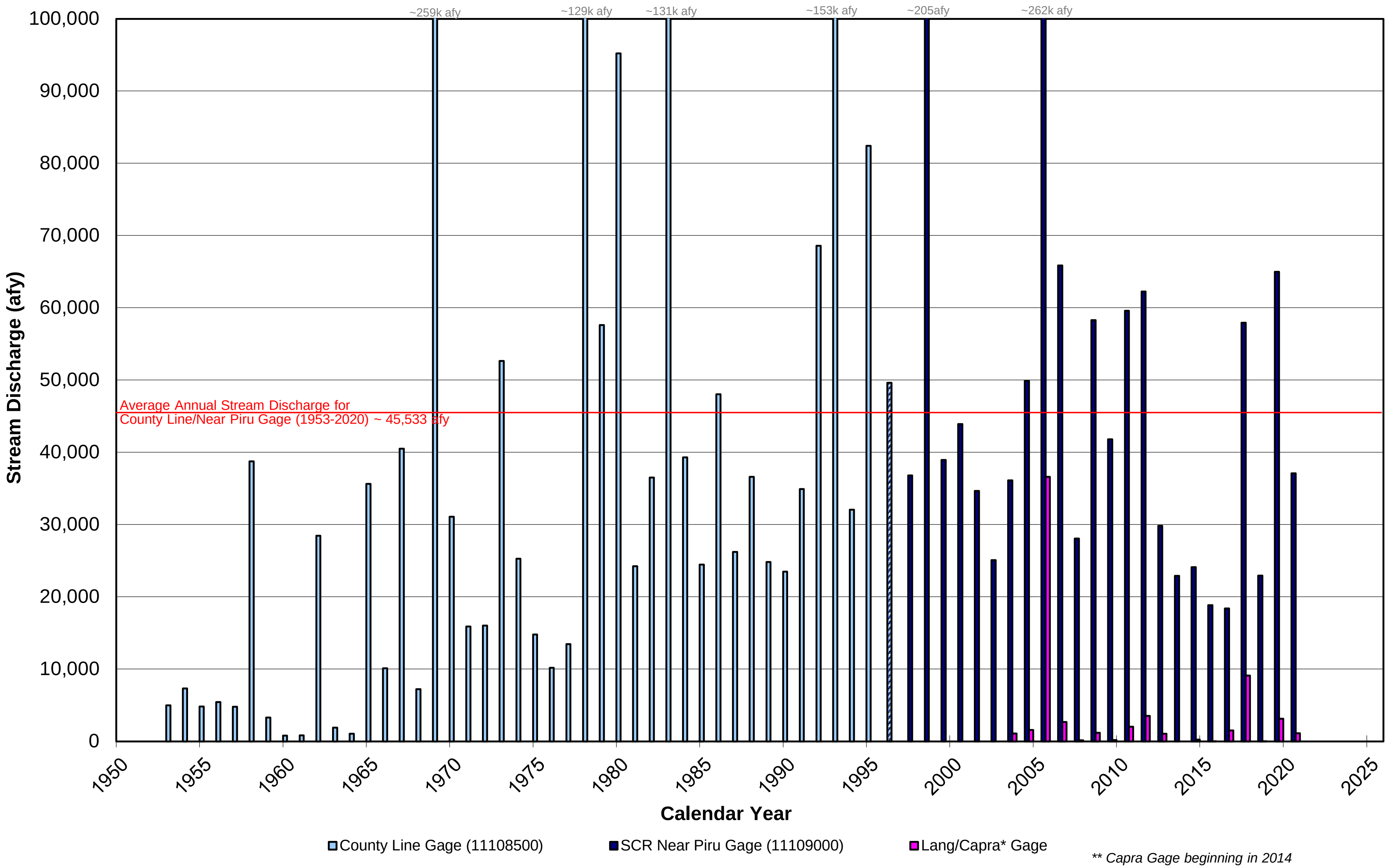
Streamflow Discharge Gage Locations

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Figure 3-15

The downstream gage, County Line gage (11108500), was moved in 1996 to its present location near Piru and renamed SCR at Piru (11109000), approximately two miles downriver. The combined record (1953-2019) of the two downstream gages indicates an annual stream discharge of approximately 45,530 afy (**Figure 3-16**). These data recorded near the County line show notably higher flows from the Santa Clarita Valley into the uppermost downstream subbasin, the Piru subbasin, over the last 35 to 40 years, likely the result of WRP discharges and releases from Castaic Lake, thereby benefiting downstream users that benefit from groundwater recharge from the Santa Clara River.

Water quality in the upper Santa Clara River is affected by natural and urban runoff, WRP discharges and source water quality from reservoir releases and potentially groundwater inflow. Annually, during the dry summer season, the composition of the stream-flow in the Santa Clara River in the Upper Santa Clara River is predominantly composed of WRP discharges, and the TDS concentrations are generally higher compared to the wet winter/spring periods. During the wet season, stream-flow in the river is composed of runoff from the watershed and urban areas, along with WRP discharges resulting in relatively lower TDS concentrations. Water quality data from surface flows in the River in the central part of the Valley (Mass Emission Station located near the I-5 overpass) were obtained from surface water monitoring by the Upper Santa Clara River Watershed Management Group as required for the region's municipal stormwater permit. Review of those results from the 2003-2019 period (2020 currently unavailable) indicate that TDS concentrations vary from about 800 to 900 mg/L during the dry summer season and about 100 to 300 mg/L during the wet winter/spring season. Comparison with alluvial groundwater quality plots from Section 3.6.2 indicates that this range of concentrations is comparable to the range of TDS concentrations observed in the alluvial aquifer.



Luhdorff & Scalmanini
Consulting Engineers

Annual Stream Discharge

Figure 3-16

Santa Clarita Valley Water Report
Santa Clarita Valley, Los Angeles County, California

Chapter 4
Summary of 2020 Water Supply and 2021 Outlook

As discussed in the preceding chapters, total water demands in the Santa Clarita Valley were 77,500 af in 2020, or about four percent higher than in 2019. Of the total demand in 2020, approximately 67,250 af were for municipal water supply (an increase of 6,000 af from 2019), and the balance (10,250 af, a decrease of approximately 2,800 af from 2019) was for agricultural and other uses, including estimated individual domestic uses. As detailed in Chapter 2, the total demand in 2020 was met by a combination of local groundwater, SWP and other imported water, and a small amount of recycled water.

4.1. 2020 Water Demand

The total water demand in 2020 was below the projected water demand in the 2015 UWMP (83,200 af), and below the short-term projected demand that was estimated in the 2019 Water Report (82,000 af). For a long-term illustration of demand, historical water use from 1980 through 2020 is plotted in **Figure 4-1** along with the currently projected municipal and agricultural water demands in the 2020 UWMP through 2050. Historically, the primary factors causing year-to-year fluctuations in water demands have been related to weather, implementation of conservation efforts, economic conditions, and variations in the number of service connections. In the short term, wet years have typically resulted in decreased water demand, and dry years have typically resulted in higher water demand. Extended dry periods, however, have resulted in decreases in demand due to conservation and water shortage awareness related to outreach by the water suppliers. The decline in water demand toward the end of the 1989 to 1992 drought is a good example. Similarly, over the recent multi-year dry period beginning in 2006, total water demands progressively declined from a historical high in 2007 to the lowest in nearly two decades in 2015 (except for a couple of interim wet years that saw a corresponding increase). These low demand levels were influenced in part from a slowing in the rate of growth in service connections that started in 2008, but they were primarily the result of intense conservation efforts following state mandated conservation measures in 2014 through 2017.

4.2. Projected 2021 Water Demand and Supplies

With the below average rainfall conditions in early 2021 that were a continuation of below average rainfall in 2020, municipal water requirements in the first quarter of 2021 were greater than first quarter demand in 2020. Recognizing those early-year conditions, and continued growth in the Valley, total water demand in 2021 is estimated to be about 86,000 af.

It is expected that both municipal and agricultural water demands in 2021 will continue to be met with a mix of water supplies as in previous years, notably local groundwater, SWP and other supplemental imported water supplies, complemented by recycled water that will continue to supply a small fraction of total water demand.

As detailed in **Table 4-1**, the 2021 SWP allocation schedule has proceeded as follows: on December 2, 2020, the initial allocation was 10 percent of water from the SWP. On March 23, 2021, it was decreased to 5 percent. Potentially available supplies for 2021 include local groundwater from the two aquifer systems (approximately 42,180 af), 5 percent SWP Table A allocation (4,760 af), carryover SWP water from 2020 (13,466 af total, anticipated use of 7,000 af in 2020), annual acquisition from BV-RRB (11,000 af), purchase of Yuba Accord Water (1,000 af), withdrawal from the Semitropic SWRU (5,000 af), withdrawal from the Rosedale-Rio Bravo Water Banking Program (16,000 af), Dry Year Water Purchase (600 af), and recycled water (450 af), totaling 94,456 af. Due to continuing water conservation efforts and diversified sources of water supply, SCV Water anticipates having more than adequate supplies to meet all water demands in 2021. Projected 2021 demand, available water supplies, and banked water supplies are summarized in **Table 4-1**.

Table 4-1. 2021 Water Demand and Water Resources (acre-feet)	
Projected 2021 Demand[1]	**86,000**
Available 2021 Water Supplies	
Local Groundwater	**42,180**
Alluvium [2]	*26,000*
Saugus Formation [3]	*16,180*
Imported Water	**51,826**
Table A Amount [4]	*4,760*
Carryover from 2020 [5]	*13,466*
Buena Vista/Rosedale-Rio Bravo Annual Supply	*11,000*
Rosedale-Rio Bravo Water Banking Program[6]	*16,000*
Semitropic SWRU Groundwater Banking Program	*5,000*
Dry Year Water Purchase	*600*
Yuba Accord	*1,000*
Recycled Water	450
Total Available 2021 Supplies	**94,456**
Balance of Banking and Exchange Programs[7]	
Semitropic (SWRU) Groundwater Banking Program	**40,278**
Rosedale-Rio Bravo Water Banking Program	**98,810**
Two-for-One Exchange Programs	**2,844**
Antelope Valley East Kern	*2,344*
United Water Conservation District	*500*
Total Additional Dry Year Supplies	**141,932**

[1]. Estimate based on 2021 year-to-date actual use through April, with demand for the rest of 2021 similar to recent years, with increase to account for growth. The range is due to uncertainty of conservation effects for the remainder of 2021.

[2] The Alluvium represents 30,000 to 40,000 afy of available supply under local wet-normal conditions, and 30,000 to 35,000 afy under local dry conditions. Due to temporary limits in well capacity, available supply in 2021 is shown to be reflective of dry year production under the Current Operating Plan described in the Updated Basin Yield Analysis, August 2009.

[3] The Saugus Formation represents 7,500 – 15,000 afy of available water supply under non-drought conditions, and up to 35,000 afy under dry conditions, dependent on available well capacity. Estimated supply for 2021 takes into consideration current available capacity and conditions in 2020.

[4] SCV Water's SWP Table A amount is 95,200 af. The initial 2021 allocation on December 2, 2020, was 10 percent (9,520 af). On March 23, 2021, the allocation was decreased to 5 percent (4,760 af).

[5] At the beginning of 2021, a total of 13,466 af of carryover supplies were available. 7,000 af is anticipated to be delivered in 2021 whereupon the rest will be reserved for potential continued dry year conditions in 2022.

[6] SCV Water's current withdrawal pumping capacity is 10,000 afy, though up to 20,000 afy is permitted if other RRBWSD pumping capacity is available for use.

[7] Described in Section 3.4.3. The programs reflect balances at the end of 2020; some of this water will be used in 2021.

4.3. Supplemental Water Supply Sources

As described in Chapter 3, SCV Water has dry-year supplemental water supply of almost 142,000 af of recoverable water outside the groundwater basin at the beginning of 2021. Through four long-term groundwater banking and exchange programs, as itemized in the lower half of **Table 4-1**, these supplemental dry-year supplies include: almost 40,300 af of recoverable water stored in the Semitropic Groundwater Storage Bank (SWRU) in Kern County, 98,800 af in the RRBWSD, and two-for-one exchange programs (available if SWP allocation is greater than 30 percent) with AVEK (2,344 af), and UWCD (500 af) at the end of 2020. These components of recoverable supplemental water supply are separately reflected in **Table 4-1** because they are intended as a future dry-year supply.

Water banking facilities at the Semitropic Water Storage District in Kern County

4.4. Water Supply Reliability

4.4.1. SWP Delivery Capability

A federal court in August 2007 ruled that certain operational changes were required of the SWP in order to protect endangered species. With the objective of protecting endangered fish such as the Delta smelt and spring-run salmon, the court order resulted in the preparation of Biological Opinions (BiOps) requiring DWR to implement mitigation requirements with resultant impacts on SWP water supply reliability. The former SWP Delivery Capability Report 2017 (DWR, 2018), maintained the restrictions on SWP operations according to the BiOps of the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fishery Service (NMFS) issued in December 2008 and June 2009, respectively. The operational rules defined in these BiOps were legally required and were used by DWR in the analyses supporting its SWP Final Delivery Capability Report 2017.

In October 2019, the USFWS and NMFS released their latest Biological Opinions based upon the USBR's new operations plans for the Central Valley Project (operated jointly with the SWP) which involves a combination of habitat restoration measures and flow requirements. Both agencies found that the proposed operations plans will not jeopardize threatened or endangered species or adversely affect habitat. The State of California has filed litigation challenging the Biological Opinions and in March of 2020 the California Department of Fish and Wildlife issued a ten-year Incidental Take Permit (ITP) for operation of the SWP that did not incorporate many of the provisions of the new Federal Biological Opinions. DWR began operations consistent with the new ITP in April 2020 and the new operating parameters were used in the analyses supporting its updated SWP Delivery Capability Report 2019 (DWR, 2019).

The Final SWP Delivery Capability Report 2019 makes updates to the impacts on SWP delivery reliability due to climate change, sea level rise, and multiple Delta-specific concerns. Further consideration is also given to the major Delta policy planning efforts currently underway: The Delta Plan, Delta Conveyance Project and EcoRestore program. With these factors, the Delivery Capability Report projects that the average annual delivery of Table A water is estimated at 58 percent (four percent lower than the 2017 estimate). SCV Water staff has assessed the impact of the current SWP Draft Delivery Capability Report 2019 on the SCV Water reliability analysis contained in the Agency's recently updated 2020 UWMP that current and anticipated supplies are available to meet projected water supply needs through the year 2050 if both passive and active conservation measures are in place. The preceding discussion of SWP supply should be considered by noting that, while the SWP Capability Report represents a reasonable scenario with respect to long term reliability, recent reductions in supply reduce the difference between available supply and demand in the future, thereby making the SCV Water service area more subject to shortages in certain dry years. Accordingly, the reduction in SWP supply reinforces the need to continue ongoing diligent efforts to conserve potable water and increase the use of recycled water to maximize utilization of potable water supplies.

More recently, DWR has entered into a revised SWP-CVP Coordinated Operating Agreement and is advancing a Voluntary Settlement Agreement relating to the State Water Resources Control Board's Bay-Delta Water Quality process. Further, under the direction of Governor Newsom, DWR recently took formal steps to withdraw proposed permits for the California Water Fix (twin tunnels) and begin a renewed environmental review and planning process for a smaller, single tunnel Delta Conveyance project. The outcome of these efforts is not known but is not expected to result in reliability outcomes below the range of those that have been modeled under the Water Fix analysis. The Delta Conveyance project is currently undergoing environmental analysis which will eventually lead to the issuance of a new Public Draft Environmental Impact Report in mid-2022.

4.4.2. Water Supply Reliability Plan

The CLWA 2011 Water Supply Reliability Plan update was completed in 2017 (Clemm and Kennedy/Jenks, 2017), and it describes the analysis and modeling of four different supply and demand scenarios from 2017 to 2050 to determine the overall reliability of the water supply in the Santa Clarita Valley. The scenarios represent a wide range of water supply assumptions on the availability of groundwater, imported water deliveries, planned increases in recycled water, and potential California Water Fix facilities. Under the most challenging scenario, SWP and groundwater supplies were reduced and improvements in Rosedale Banking Program and Saugus dry-year pumping were suspended. Under such reduced supply conditions, the analysis concluded that planned improvements to the Rosedale Banking Program as well as conjunctive use of Saugus Formation storage were necessary.

The Water Reliability Plan was updated in early 2021 by Geosyntec Consultants in parallel with the preparation of the 2020 UWMP. It incorporated refinements to the Basins Operating Plan outlined in the Draft Groundwater Sustainability Plan. It also analyzed alternative scenarios involving investments into water banking programs and possible Sites reservoir as alternatives to development of additional Saugus wells.

4.5. Water Supply Strategy

SCV Water has implemented a number of projects that are part of an overall program to provide facilities needed to firm up imported water supplies during times of drought. These involve water conservation, surface and groundwater storage, water transfers and exchanges, water recycling, additional short-term pumping from the Saugus Formation, and increasing the reliability of SCV Water's imported supply. This overall strategy is designed to meet increasing water demands while assuring a reasonable degree of supply reliability.

Part of the overall water supply strategy is to conjunctively use groundwater and imported water to provide area residents with consistent quality and reliability of service. The actual blend of imported water and groundwater in any given year and location in the Valley is an operational decision and varies over time due to source availability and operational capacity of SCV Water facilities. The goal is to conjunctively use the available water resources so that the overall reliability of water supply is maximized while utilizing local groundwater at a sustainable rate. Such was the case in 2019, where the ample amount of available SWP supplies provided operational flexibility in reducing groundwater pumping in the Valley to address drought impacts on groundwater levels in the eastern portion of the subbasin.

There are numerous ongoing efforts to produce an adequate and reliable supply of good quality water for Valley residents, including increased recovery capacity at both Semitropic and RRBWSD Banking Programs, new and replacement wells in the Saugus Formation to increase groundwater supplies, and treatment of perchlorate and PFAS to restore well capacity in both the Saugus Formation and Alluvium. Water consumers expect their needs will continue to be met with a high degree of reliability and quality of service. To that end, SCV Water's stated reliability goal is to deliver a reliable and high-quality water supply for their customers, even during dry periods. Based on conservative water supply and demand assumptions contained in the 2020 UWMP for a planning horizon to 2050, in combination with conservation of non-essential demand during certain dry years, SCV Water believes implementing their water plan will successfully achieve this goal.

Chapter 5
Water Conservation

As California continues to manage its valuable water resources through the challenges of climate change and water reliability issues, SCV Water is committed to a water conservation program comprising several measures that incorporate education, incentives, and conservation mandates among all the various customers present in the Valley. As a member of the California Water Efficiency Partnership (CalWEP), SCV Water prioritizes urban water use efficiency and conservation in their management strategy and public messaging.

5.1. Recent Conservation Efforts

The Santa Clarita Valley Water Use Efficiency Strategic Plan (2008 SCVWUESP) is a comprehensive long-term conservation plan for the Santa Clarita Valley with objectives, policies, and programs designed to promote proven and cost-effective conservation practices. The preparation of the 2008 SCVWUESP included input from stakeholders and the community at large and provided a detailed study of residential and commercial water use, and recommended programs designed to reduce overall Valley-wide water demand by ten percent by 2030. Following the completion of the 2008 SCVWUESP, Senate Bill SB X7-7 was passed in November 2009 as part of the Water Conservation Act of 2009. SB X7-7 included requirements for reductions in per capita water use by 2020 of 20 percent which exceeded the targets outlined in the 2008 SCVWUESP.

In January 2014, as a response to drought conditions, the Governor of the State of California declared a drought emergency and asked that all Californians take voluntary action to reduce their 2013 water use by 20 percent. In February 2014, the Santa Clarita Valley Family of Water Suppliers approved the Water Conservation Action Plan that provided a series of water conservation guidelines customers could implement to reduce their water use by 20 percent. In July 2014, the SWRCB adopted temporary emergency water conservation regulations that required water agencies to implement the actions of their water shortage contingency plans that imposed multiple mandatory restrictions on indoor and outdoor water use. These orders were modified by the Governor in 2016 to allow for local management needs while also directing the state to develop state-wide plans for long-term conservation goals and water use efficiency.

In 2015, an updated Water Use Efficiency Strategic Plan (WUESP) that incorporated the SB X7-7 targeted reductions was finalized. The updated WUESP was supported by a thorough economic analysis intended to guide local water conservation efforts planned and implemented by SCV Water in the coming years. The economic analysis concluded that water conservation measures are more economically feasible as compared to the economic benefit of adding recycled water infrastructure in meeting a portion of future water demands. The WUESP is consistent with

SCV Water's Strategic Plan Objectives including:

- Ensure long-term average water supply meets current and future demand.
- Meet local water demands.
- Achieve the water conservation target of 20 percent per capita by 2020.

As mandated by the Water Conservation Act of 2009 (SBx7-7) and initially described in the 2010 and 2015 UWMP, SCV Water has demonstrated compliance with the Interim Daily Per Capita Water Use Target every year since 2015 through 2020. As summarized in **Table 5-1**, SCV Water met their 2020 Target.

Beginning with the 2020 UWMP, SCV Water will begin reporting on water use reduction and SBx7-7 compliance as one entity. A new 2020 Compliance Water Use Target has been established at 220 gallons per capita per day (GPCD), and in 2020 the Base Daily Per Capita water use was met and compliance with SBx7-7 was achieved (Kennedy/Jenks, 2021).

Table 5-1. 20x2020 Compliance GPCD Targets and Current Levels

Division	Baselines	2020 Targets	Actual 2020	Percent Reduction
LACWD 36[a]	235	188	125	--
Newhall	238	190	196	36%
Santa Clarita	251	201	188	25%
Valencia	335	268	231	31%
SCV Water (combined)a	272	218	204	25%

Source: 2020 Actual GPCD

a) Sincle Los Angeles County Waterworks District No. 36 does not have 3,000 AF served or 3,000 connections, SB X7-7 does not apply.

5.2. Current and Future Conservation Efforts

In 2018, the State Legislature and Governor Brown enacted AB 1668 and SB 606 in support of continuing efforts to "make water conservation a California way of life." The legislation recognizes that the efficient use of water is both cost-effective and critical to ensuring water supply reliability during drought and non-drought conditions. Water agencies are developing a series of long-term urban water use efficiency standards including indoor and outdoor efficiency targets, with consideration for local weather conditions, and distribution system water losses. Beginning in 2023, SCV Water will be required to comply with its urban water use objective on an annual basis. The SWRCB may issue informational or conservation orders to agencies failing to meet their objectives. Details specific to AB 1668 and SB 606 standards and protocols are scheduled for release in 2022. The AB 1668 and SB 606 compliance period starts July 1, 2022 with the first performance reports are due by January 1, 2024.

SCV Water has worked with Los Angeles County and the City of Santa Clarita to aggressively implement water conservation in the SCV Water service area. SCV Water, Los Angeles County, and the City of Santa Clarita have formed the Sustainable Water Action Team (formerly convened as the Santa Clarita Drought Committee). The specific purpose of the committee is to work collaboratively to manage the conjunctive use of the Valley's water supplies, respond to drought conditions and ensure the progressive implementation of water use efficiency programs in the Santa Clarita Valley.

SCV Water provides additional information on their website regarding water conservation tips, gardening classes, and rebates. The agency website provides steps residents can take to conserve water for both indoor and outdoor use, along with a calendar for upcoming gardening classes. Rebates for water efficient products and services are provided for individual residence, businesses, and areas with large landscapes or HOA's. This includes pool covers, soil moisture sensors, smart irrigation controllers, lawn replacement, irrigation rebates (Healthy and Efficient Landscape Programs-HELP), virtual home checkups, school retrofit program, and free landscape irrigation surveys. More information on these services and rebates can be found on the SCV Water website (https://yourscvwater.com/save-water-money/#_rebates).

5.3. 2020 Water Use

2020 saw a return to dry conditions for the Valley. However, despite a continued growth in service connections, there has been a long-term overall decrease in water consumption since 2013. As detailed in **Table 2-3** and Appendix A Table 1, the total reduction in municipal water use from 2013 in 2020 was almost 7,500 af (10 percent). All divisions except Newhall utilized less water in 2020 than the baseline year of 2013. The breakdown of total water savings over that period by service area included:

- VWD – 7,109 af (2,316 million gallons)
- SCWD – 1,924 af (627 million gallons)
- NWD – increase of 218 af (71 million gallons)
- LACWD 36 – 34 af (11 million gallons)

As noted in **Table 5-1** above, each division in the Valley has met its respective SB X7-7 20 percent by 2020 reduction in GPCD requirement.

Chapter 6
References

AECOM, Bouquet Canyon Creek Restoration Project – Draft Initial Study/Mitigated Negative Declaration, August 2016.

AECOM, Fourth Quarter 2019 SATP NPDES Self-Monitoring Report, February 2020, https://www.envirostor.dtsc.ca.gov/esi/uploads/geo_report/8283353507/SATP%20NPDES%20SMR%20 2019%204Q.pdf

California Department of Toxic Substances Control. (October 2019). Whittaker-Bermite Community Update [Fact Sheet], https://www.envirostor.dtsc.ca.gov/public/deliverable_documents/5905445933/Whittaker_Communinty%20Update_1019.pdf

California Department of Water Resources (DWR), California's Groundwater, Bulletin 118 – Update 2016, December 2016.

California Department of Water Resources (DWR), The State Water Project Draft Delivery Capability Report 2017, December 2017.

California Department of Water Resources (DWR), The State Water Project Delivery Capability Report 2019, August 2020.

California State Water Resource Control Board, Public Water System Information and Resources, https://www.waterboards.ca.gov/pfas/drinking_water.html, June 2020.

Castaic Lake Water Agency (CLWA), CLWA Santa Clarita Water Division, Newhall County Water District, and Valencia Water Company, 2005 Urban Water Management Plan, Los Angeles County Waterworks District No. 36, Cooperating Agency, November 2005.

Castaic Lake Water Agency (CLWA), CLWA Santa Clarita Water Division, Newhall County Water District, and Valencia Water Company, 2010 Urban Water Management Plan, Los Angeles County Waterworks District No. 36, Cooperating Agency, June 2011.

Castaic Lake Water Agency (CLWA), CLWA Santa Clarita Water Division, Newhall County Water District, and Valencia Water Company, 2015 Urban Water Management Plan, Los Angeles County Waterworks District No. 36, Cooperating Agency, June 2016.

Castaic Lake Water Agency (CLWA), Groundwater Management Plan, Santa Clara River Valley Groundwater Basin, East Subbasin, Los Angeles County, California, December 2003.

CH2M Hill and Luhdorff & Scalmanini, Consulting Engineers, Analysis of Groundwater Basin Yield, Upper Santa Clara River Groundwater Basin, East Subbasin, Los Angeles County, California, prepared for Upper Basin Water Purveyors, August 2005.

CH2M Hill Regional Groundwater Flow Model for the Santa Clarita Valley, Model Development and Calibration, April 2004.

CH2M Hill, Analysis of Perchlorate Containment in Groundwater Near the Whittaker-Bermite Property, Santa Clarita, California, Prepared in support of the 97-005 Permit Application, December 2004.

CH2M Hill, Evaluation of Historical and Projected Future Flows to Ventura County Resulting From Importation of State Project Water to the Santa Clara River Watershed, July, 1998.

CH2M Hill, Evaluation of Historical and Projected Future Flows to Ventura County Resulting From Importation of State Project Water to the Santa Clara River Watershed, Update 2001.

CH2M Hill, Saugus Formation Volatile Organic Compound Investigation Report, Santa Clarita, California, prepared for Castaic Lake Water Agency, October 2015.

CH2M Hill, Technical Memorandum, Calibration Update of the Regional Groundwater Flow Model for the Santa Clarita Valley, Santa Clarita, California, August 2005.

Executive Department State of California, Executive Order B-29-15, April 2015.

Executive Department State of California, Executive Order B-37-16 Making Water conservation a California Way of Life, May 2016

Geosyntec Consultants, Technical Memorandum, Castaic Conceptual Feasibility Study for Infiltration of Recycled Water, Castaic, California, January 2016.

GSI Water Solutions (GSI), Inc. 2020. Water Budget Development for the Santa Clara River Valley East Groundwater Subbasin, Draft Technical Memorandum. Available at: https://yourscvwater.com/uwmp/

Kennedy/Jenks Consultants, Draft Report, Recycled Water Master Plan, Castaic Lake Water Agency, May 2002.

Kennedy/Jenks Consultants, Recycled Water Master Plan, Castaic Lake Water Agency, September 2016.

Kennedy/Jenks Consultants, Groundwater Treatment Implementation Plan, April 2021.

Kennedy/Jenks Consultants, Santa Clarita Valley Water Agency 2020 Urban Water Management Plan, June 2021.

Luhdorff and Scalmanini, Consulting Engineers (LSCE), 2019 Santa Clarita Valley Water Report, prepared for Santa Clarita Valley Water Agency and Los Angeles County Waterworks District No. 36, July 2020.

Luhdorff and Scalmanini, Consulting Engineers (LSCE), Impact and Response to Perchlorate Contamination, Valencia Water Company Well Q2, prepared for Valencia Water Company, April 2005.

Luhdorff and Scalmanini, Consulting Engineers and GSI Water Solutions, Analysis of Groundwater Supplies and Groundwater Basin Yield, Upper Santa Clara River Groundwater Basin, East Subbasin, prepared for Santa Clarita Valley Municipal Water Purveyors, August 2009.

Maddaus Water Management, (MWM) Inc., SCV Family of Water Supplies Water Use Efficiency Strategic Plan, June 2015.

Memorandum of Understanding between the Santa Clara River Valley Upper Basin Water Purveyors and United Water Conservation District, August 2001.Memorandum of Understanding between Castaic Lake Water Agency, CLWA Santa Clarita Water Division, Newhall County Water District and Valencia Water Company, December 2006.

Memorandum of Understanding between the Santa Clarita Valley Water Agency and United Water Conservation District, October 2018.

Nancy Clemm and Kennedy/Jenks Consultants, Final Report, 2017 Water Supply Reliability Plan-Updated, November 2017

Richard C. Slade & Associates, LLC, 2001 Update Report, Hydrogeologic Conditions in the Alluvial and Saugus Formation Aquifer Systems, prepared for Santa Clarita Valley Water Purveyors, July 2002.

Sanitation Districts of Los Angeles County (LACSD), 2013. Santa Clarita Valley Sanitation District Chloride Compliance Facilities Plan and Environmental Impact Report – Final. SCH# 2012011010. October 2013

Santa Clarita Valley Family of Water Suppliers, et al., Water Use Efficiency Strategic Plan, June 24, 2015.

Santa Clarita Valley Water Agency, 2020 Urban Water Management Plan, Los Angeles County Waterworks District No. 36, Cooperating Agency, April 2021.

Slade, R. C., Hydrogeologic Assessment of the Saugus Formation in the Santa Clara Valley of Los Angeles County, California, Vols. I and II, prepared for Castaic Lake Water Agency, 1988.

Slade, R. C., Hydrogeologic Investigation of Perennial Yield and Artificial Recharge Potential of the Alluvial Sediments in the Santa Clarita River Valley of Los Angeles County, California, Vols. I and II, prepared for Upper Santa Clara Water Committee, 1986.

Trussell Technologies and GSI Water Solutions, Upper Santa Clara River Water Recharge Feasibility Study, Prepared for Newhall County Water District, Castaic Lake Water Agency, CLWA Santa Clarita Water Division, and Valencia Water Company, September 2017

Appendix A
Historical Water Supply and Utilization Tables for Municipal and Agricultural/Other Users

Appendix A Table 1
Water Supply Utilization by Santa Clarita Valley Water Agency and Los Angeles County Waterworks District No. 36
Santa Clarita Valley Water Report
(Acre-Feet)

	Santa Clarita Water Division				Los Angeles County Waterworks District No. 36				Newhall Water Division				Valencia Water Division					SCV Water[1]			SCV Water, All Municipal Divisions, and LACWD 36				
	SCV Water	Local Production			SCV Water	Local Production			SCV Water	Local Production			SCV Water	Local Production		Other		SCV Water	Local Production		SCV Water	Local Production		Other	
Year	*Imported Water*[2]	*Alluvium*	*Saugus Formation*[3]	**Total**	*Imported Water*[2]	*Alluvium*[4]	*Saugus Formation*	**Total**	*Imported Water*[2]	*Alluvium*	*Saugus Formation*[3]	**Total**	*Imported Water*[2]	*Alluvium*	*Saugus Formation*	*Recycled Water*[5]	**Total**	*Imported Water*[2,6]	*Saugus Formation*	**Total**	*Imported Water*[1]	*Alluvium*	*Saugus Formation*	*Recycled Water*	**Total**
1980	1,126	9,467	0	**10,593**	0	-	-	**0**	0	1,170	2,363	**3,533**	0	5,995	1,644	-	**7,639**	--	--	**--**	1,126	16,632	4,007	-	**21,765**
1981	4,603	7,106	0	**11,709**	0	-	-	**0**	0	1,350	2,621	**3,971**	1,214	5,597	1,808	-	**8,619**	--	--	**--**	5,817	14,053	4,429	-	**24,299**
1982	6,454	4,091	0	**10,545**	145	-	-	**145**	0	1,178	2,672	**3,850**	3,060	3,415	897	-	**7,372**	--	--	**--**	9,659	8,684	3,569	-	**21,912**
1983	5,214	4,269	0	**9,483**	207	-	-	**207**	0	1,147	2,787	**3,934**	3,764	3,387	611	-	**7,762**	--	--	**--**	9,185	8,803	3,398	-	**21,386**
1984	6,616	6,057	0	**12,673**	240	-	-	**240**	0	1,549	2,955	**4,504**	4,140	4,975	854	-	**9,969**	--	--	**--**	10,996	12,581	3,809	-	**27,386**
1985	6,910	6,242	0	**13,152**	272	-	-	**272**	0	1,644	3,255	**4,899**	4,641	4,633	885	-	**10,159**	--	--	**--**	11,823	12,519	4,140	-	**28,482**
1986	8,366	5,409	0	**13,775**	342	-	-	**342**	0	1,842	3,548	**5,390**	5,051	5,167	1,427	-	**11,645**	--	--	**--**	13,759	12,418	4,975	-	**31,152**
1987	9,712	5,582	0	**15,294**	361	-	-	**361**	22	2,127	3,657	**5,806**	6,190	4,921	1,305	-	**12,416**	--	--	**--**	16,285	12,630	4,962	-	**33,877**
1988	11,430	5,079	63	**16,572**	434	-	-	**434**	142	2,283	4,041	**6,466**	7,027	4,835	2,300	-	**14,162**	--	--	**--**	19,033	12,197	6,404	-	**37,634**
1989	12,790	5,785	0	**18,575**	457	-	-	**457**	428	2,367	4,688	**7,483**	7,943	5,826	2,529	-	**16,298**	--	--	**--**	21,618	13,978	7,217	-	**42,813**
1990	12,480	5,983	40	**18,503**	513	-	-	**513**	796	1,936	4,746	**7,478**	7,824	5,232	3,516	-	**16,572**	--	--	**--**	21,613	13,151	8,302	-	**43,066**
1991	6,158	5,593	4,781	**16,532**	435	-	-	**435**	675	1,864	4,994	**7,533**	700	9,951	4,642	-	**15,293**	--	--	**--**	7,968	17,408	14,417	-	**39,793**
1992	6,350	8,288	2,913	**17,551**	421	-	-	**421**	802	1,994	5,160	**7,956**	6,338	6,615	2,385	-	**15,338**	--	--	**--**	13,911	16,897	10,458	-	**41,266**
1993	3,429	12,016	2,901	**18,346**	465	-	-	**465**	1,075	1,977	5,068	**8,120**	8,424	5,815	2,182	-	**16,421**	--	--	**--**	13,393	19,808	10,151	-	**43,352**
1994	5,052	10,996	3,863	**19,911**	453	-	-	**453**	906	2,225	5,103	**8,234**	7,978	6,847	2,565	-	**17,390**	--	--	**--**	14,389	20,068	11,531	-	**45,988**
1995	7,955	10,217	1,726	**19,898**	477	-	-	**477**	1,305	1,675	4,775	**7,755**	7,259	8,698	1,586	-	**17,543**	--	--	**--**	16,996	20,590	8,087	-	**45,673**
1996	9,385	10,445	2,176	**22,006**	533	-	-	**533**	1,213	1,803	4,871	**7,887**	6,962	12,433	326	-	**19,721**	--	--	**--**	18,093	24,681	7,373	-	**50,147**
1997	10,120	11,268	1,068	**22,456**	785	-	-	**785**	1,324	2,309	5,168	**8,801**	9,919	11,696	516	-	**22,131**	--	--	**--**	22,148	25,273	6,752	-	**54,173**
1998	8,893	11,426	0	**20,319**	578	-	-	**578**	1,769	1,761	4,557	**8,087**	9,014	10,711	149	-	**19,874**	--	--	**--**	20,254	23,898	4,706	-	**48,858**
1999	10,772	13,741	0	**24,513**	654	-	-	**654**	5,050	1,676	2,622	**9,348**	10,806	11,823	106	-	**22,735**	--	--	**--**	27,282	27,240	2,728	-	**57,250**
2000	13,751	11,529	0	**25,280**	800	-	-	**800**	6,024	1,508	2,186	**9,718**	12,004	12,179	1,007	-	**25,190**	--	--	**--**	32,579	25,216	3,193	-	**60,988**
2001	15,648	9,941	0	**25,589**	907	-	-	**907**	5,452	1,641	2,432	**9,525**	13,362	10,518	835	-	**24,715**	--	--	**--**	35,369	22,100	3,267	-	**60,736**
2002	18,916	9,513	0	**28,429**	1,069	-	-	**1,069**	5,986	981	3,395	**10,362**	15,792	11,603	965	-	**28,360**	--	--	**--**	41,763	22,097	4,360	-	**68,220**
2003	20,665	6,424	0	**27,089**	1,175	-	-	**1,175**	6,572	1,266	2,513	**10,351**	16,004	11,707	1,068	50	**28,829**	--	--	**--**	44,416	19,397	3,581	50	**67,444**
2004	22,045	7,146	0	**29,191**	854	380	-	**1,234**	5,896	1,582	3,739	**11,217**	18,410	9,862	1,962	420	**30,654**	--	--	**--**	47,205	18,970	5,701	420	**72,296**
2005	16,476	12,408	0	**28,884**	857	343	-	**1,200**	5,932	1,389	3,435	**10,756**	14,732	12,228	2,513	418	**29,891**	--	--	**--**	37,997	26,368	5,948	418	**70,731**
2006	16,548	13,156	0	**29,704**	1,289	-	-	**1,289**	5,898	2,149	3,423	**11,470**	16,313	11,884	2,449	419	**31,065**	--	--	**--**	40,048	27,189	5,872	419	**73,528**
2007	20,488	10,686	0	**31,174**	1,406	-	-	**1,406**	6,478	1,806	3,691	**11,975**	16,779	13,140	2,367	470	**32,756**	--	--	**--**	45,151	25,632	6,058	470	**77,311**
2008	18,598	11,878	0	**30,476**	1,354	-	-	**1,354**	5,428	1,717	4,195	**11,340**	16,325	14,324	1,770	311	**32,730**	--	--	**--**	41,705	27,919	5,965	311	**75,900**
2009	17,739	10,077	0	**27,816**	1,243	-	-	**1,243**	4,832	1,860	3,868	**10,559**	14,732	12,459	2,836	328	**30,355**	--	--	**--**	38,545	24,396	6,704	328	**69,973**
2010	15,188	10,607	0	**25,795**	1,141	-	-	**1,141**	3,035	2,323	4,173	**9,531**	11,214	13,054	2,995	336	**27,599**	--	1,643	**1,643**	30,578	25,984	8,811	336	**65,709**
2011	13,593	10,195	2,038	**25,826**	1,172	-	-	**1,172**	1,325	3,216	5,135	**9,676**	14,718	12,775	265	373	**28,131**	--	150	**150**	30,808	26,186	7,588	373	**64,955**
2012	15,600	10,192	2,164	**27,956**	471	-	794	**1,265**	2,965	2,631	4,873	**10,469**	16,522	12,770	302	428	**30,022**	--	--	**--**	35,558	25,593	8,133	428	**69,712**
2013	20,059	7,262	2,275	**29,596**	485	-	811	**1,296**	4,488	1,405	4,668	**10,561**	18,249	12,764	594	400	**32,007**	--	--	**--**	43,281	21,431	8,348	400	**73,460**
2014	21,478	4,220	1,832	**27,530**	4	-	1,238	**1,242**	3,942	1,383	4,520	**9,845**	7,668	19,080	2,339	474	**29,561**	--	--	**--**	33,092	24,683	9,929	474	**68,178**
2015	15,019	4,597	2,167	**21,783**	3	-	973	**976**	2,478	1,131	4,491	**8,100**	6,648	13,605	2,929	450	**23,632**	--	--	**--**	24,148	19,333	10,560	450	**54,491**
2016	17,943	3,485	2,494	**23,922**	3	-	1,047	**1,050**	2,876	626	4,755	**8,257**	10,308	11,133	2,789	507	**24,737**	--	--	**--**	31,130	15,244	11,085	507	**57,966**
2017	23,257	907	2,191	**26,355**	1	-	1,093	**1,094**	5,831	780	2,325	**8,936**	17,562	7,737	1,370	501	**27,170**	--	--	**--**	46,651	9,424	6,979	501	**63,555**
2018	21,611	2,465	2,136	**26,212**	5	-	1,106	**1,111**	5,583	728	2,662	**8,973**	12,555	10,837	2,837	352	**26,581**	2,245	1,931	**4,176**	41,999	14,030	10,672	352	**67,053**
2019	19,002	2,762	2,332	**24,096**	7	-	972	**979**	3,770	1,044	3,518	**8,332**	17,950	5,243	1,676	458	**25,327**	1,343	1,156	**2,499**	42,072	9,049	9,654	458	**61,233**
2020	23,110	2,517	2,045	**27,672**	5	-	1,257	**1,262**	5,439	1,322	4,018	**10,779**	18,248	3,741	2,441	468	**24,898**	1,394	1,212	**2,606**	48,196	7,580	10,973	468	**67,217**

1. Initial operation at SCV Water Groundwater Treatment Facilities required discharging treated groundwater to the stormwater system including Saugus 1 and 2 startup in 2010/2011 and V201 startup in 2018-2020.
2. Reflects State Water Project through 2006; includes imported water from State Water Project and Buena Vista WSD Agreement beginning in 2007 and continuing through the present year.
3. In January 2011, SCV Water began operation of the Saugus groundwater containment project as part of municipal water supply. The amounts of treated groundwater from Saugus 1 and 2 utilized by SCWD and NWD reflect the estimated distribution to each Division consistent with the proportions in the December, 2006 MOU that establishes amounts to be delivered to SCWD and NWD. Although the MOU indicates all the treated Saugus 1 and 2 water is delivered to NWD and SCWD, a minor, unquantifiable amount of the water may have been delivered to the other purveyors as a result of varying distribution system operations.
4. Groundwater purchased from Pitchess Detention Center.
5. Recycled water totals for 2012 and 2013 are estimates based on the water treament plant production meter; estimates were necessary due to customer meter failure.
6. Imported water was utilized to blend with the treated V201 water to lower the sulfate concentration to a permissable level for discharge to the Stormwater System. The tracking of this water began in 2019 and is estimated for 2018.

Appendix A Table 2
Individual Water Supply Utilization by Agricultural and Other Users
Santa Clarita Valley Water Report
(Acre-Feet)

Year	Five Point			Pitchess Detention Center[1]			Small Private Domestic, Irrigation, and Golf Course Uses			Whittaker-Bermite SATP[2]		All Agricultural and Other Users			
	Local Production		**Total**	SCV Water	Local Production	**Total**	Local Production		**Total**	Local Production	**Total**	SCV Water	Local Production		**Total**
	Alluvium	*Saugus Formation*		*Imported Water*[3]	*Alluvium*		*Alluvium*[4]	*Saugus Formation*[5]		*Saugus Formation*		*Imported Water*[3]	*Alluvium*	*Saugus Formation*	
1980	11,331	20	**11,351**	0	3,000	**3,000**	500	562	**1,062**	--	**--**	0	14,831	582	**15,413**
1981	13,237	20	**13,257**	0	3,000	**3,000**	500	521	**1,021**	--	**--**	0	16,737	541	**17,278**
1982	9,684	20	**9,704**	0	3,000	**3,000**	500	501	**1,001**	--	**--**	0	13,184	521	**13,705**
1983	7,983	20	**8,003**	0	3,000	**3,000**	500	434	**934**	--	**--**	0	11,483	454	**11,937**
1984	11,237	20	**11,257**	0	3,000	**3,000**	500	620	**1,120**	--	**--**	0	14,737	640	**15,377**
1985	9,328	20	**9,348**	0	3,000	**3,000**	500	555	**1,055**	--	**--**	0	12,828	575	**13,403**
1986	8,287	20	**8,307**	0	3,000	**3,000**	500	490	**990**	--	**--**	0	11,787	510	**12,297**
1987	6,512	20	**6,532**	0	3,000	**3,000**	500	579	**1,079**	--	**--**	0	10,012	599	**10,611**
1988	5,951	20	**5,971**	0	3,000	**3,000**	500	504	**1,004**	--	**--**	0	9,451	524	**9,975**
1989	6,243	20	**6,263**	0	3,000	**3,000**	500	522	**1,022**	--	**--**	0	9,743	542	**10,285**
1990	8,225	20	**8,245**	0	2,000	**2,000**	500	539	**1,039**	--	**--**	0	10,725	559	**11,284**
1991	7,039	20	**7,059**	0	2,240	**2,240**	500	480	**980**	--	**--**	0	9,779	500	**10,279**
1992	8,938	20	**8,958**	987	1,256	**2,243**	500	446	**946**	--	**--**	987	10,694	466	**12,147**
1993	8,020	20	**8,040**	443	1,798	**2,241**	500	439	**939**	--	**--**	443	10,318	459	**11,220**
1994	10,606	20	**10,626**	311	1,959	**2,270**	500	474	**974**	--	**--**	311	13,065	494	**13,870**
1995	11,174	20	**11,194**	6	2,200	**2,206**	500	453	**953**	--	**--**	6	13,874	473	**14,353**
1996	12,020	266	**12,286**	780	1,237	**2,017**	500	547	**1,047**	--	**--**	780	13,757	813	**15,350**
1997	12,826	445	**13,271**	1,067	1,000	**2,067**	500	548	**1,048**	--	**--**	1,067	14,326	993	**16,386**
1998	10,250	426	**10,676**	12	2,000	**2,012**	500	423	**923**	--	**--**	12	12,750	849	**13,611**
1999	13,824	479	**14,303**	20	1,842	**1,862**	500	509	**1,009**	--	**--**	20	16,166	988	**17,174**
2000	11,857	374	**12,231**	3	1,644	**1,647**	1,220	513	**1,733**	--	**--**	3	14,721	887	**15,611**
2001	12,661	300	**12,961**	0	1,604	**1,604**	1,224	573	**1,797**	--	**--**	0	15,489	873	**16,362**
2002	13,514	211	**13,725**	0	1,602	**1,602**	1,063	589	**1,652**	--	**--**	0	16,179	800	**16,979**
2003	10,999	122	**11,121**	0	2,273	**2,273**	931	504	**1,435**	--	**--**	0	14,203	626	**14,829**
2004	10,991	268	**11,259**	0	2,725	**2,725**	1,071	535	**1,606**	--	**--**	0	14,787	803	**15,590**
2005	8,648	6	**8,654**	0	2,499	**2,499**	1,133	499	**1,632**	--	**--**	0	12,280	505	**12,785**
2006	11,477	934	**12,411**	0	3,026	**3,026**	1,369	506	**1,875**	--	**--**	0	15,872	1,440	**17,312**
2007	9,968	971	**10,939**	0	2,085	**2,085**	1,088	656	**1,744**	--	**--**	0	13,141	1,627	**14,768**
2008	9,191	330	**9,521**	0	3,506	**3,506**	1,100	623	**1,723**	--	**--**	0	13,797	953	**14,750**
2009	11,061	379	**11,440**	0	3,432	**3,432**	1,097	595	**1,692**	--	**--**	0	15,590	974	**16,564**
2010	10,772	366	**11,138**	0	3,446	**3,446**	957	558	**1,515**	--	**--**	0	15,175	924	**16,099**
2011	10,323	344	**10,667**	0	3,226	**3,226**	1,013	533	**1,546**	--	**--**	0	14,562	877	**15,439**
2012	11,296	0	**11,296**	0	2,722	**2,722**	1,090	586	**1,676**	--	**--**	0	15,108	586	**15,694**
2013	12,091	0	**12,091**	0	2,309	**2,309**	1,061	690	**1,751**	--	**--**	0	15,461	690	**16,151**
2014	9,262	0	**9,262**	0	2,082	**2,082**	869	672	**1,541**	--	**--**	0	12,213	672	**12,885**
2015	8,868	0	**8,868**	0	1,768	**1,768**	723	720	**1,443**	--	**--**	0	11,359	720	**12,079**
2016	11,276	0	**11,276**	0	1,616	**1,616**	713	754	**1,467**	--	**--**	0	13,605	754	**14,359**
2017	10,348	0	**10,348**	0	1,630	**1,630**	576	884	**1,460**	--	**--**	0	12,554	884	**13,438**
2018	10,231	0	**10,231**	0	1,611	**1,611**	595	634	**1,229**	209	**209**	0	12,437	843	**13,280**
2019	9,790	0	**9,790**	0	1,560	**1,560**	617	543	**1,160**	524	**524**	0	11,967	1,067	**13,034**
2020	7,291	0	**7,291**	0	1,282	**1,282**	616	612	**1,228**	448	**448**	0	9,189	1,060	**10,249**

1. *Formerly called Los Angeles County Honor Farm; groundwater sold to LACWD 36 in 2004 and 2005.*
2. *Whittaker-Bermite SATP pumping beginning in 2018, although operation reportedly began in August, 2017.*
3. *Reflects State Water Project through 2006; includes imported water from State Water Project and Buena Vista WSD Agreement beginning in 2007.*
4. *Sand Canyon Country Club irrigation and estimated private pumping.*
5. *Valencia Country Club and Vista Valencia Golf Course irrigation.*

Appendix A Table 3
Total Water Supply Utilization for Municipal, Agricultural, and Other Uses
Santa Clarita Valley Water Report
(Acre-Feet)

Year	SCV Water	Local Production		Other	Total
	Imported Water	*Alluvium*	*Saugus Formation*	*Recycled Water*	
1980	1,126	31,463	4,589	-	**37,178**
1981	5,817	30,790	4,970	-	**41,577**
1982	9,659	21,868	4,090	-	**35,617**
1983	9,185	20,286	3,852	-	**33,323**
1984	10,996	27,318	4,449	-	**42,763**
1985	11,823	25,347	4,715	-	**41,885**
1986	13,759	24,205	5,485	-	**43,449**
1987	16,285	22,642	5,561	-	**44,488**
1988	19,033	21,648	6,928	-	**47,609**
1989	21,618	23,721	7,759	-	**53,098**
1990	21,613	23,876	8,861	-	**54,350**
1991	7,968	27,187	14,917	-	**50,072**
1992	14,898	27,591	10,924	-	**53,413**
1993	13,836	30,126	10,610	-	**54,572**
1994	14,700	33,133	12,025	-	**59,858**
1995	17,002	34,464	8,560	-	**60,026**
1996	18,873	38,438	8,186	-	**65,497**
1997	23,215	39,599	7,745	-	**70,559**
1998	20,266	36,648	5,555	-	**62,469**
1999	27,302	43,406	3,716	-	**74,424**
2000	32,582	39,937	4,080	-	**76,599**
2001	35,369	37,589	4,140	-	**77,098**
2002	41,763	38,276	5,160	-	**85,199**
2003	44,416	33,599	4,207	50	**82,273**
2004	47,205	33,757	6,503	420	**87,885**
2005	37,997	38,648	6,453	418	**83,516**
2006	40,048	43,061	7,312	419	**90,840**
2007	45,151	38,773	7,685	470	**92,079**
2008	41,705	41,716	6,918	311	**90,650**
2009	38,545	39,986	7,678	328	**86,537**
2010	30,578	41,159	9,735	336	**81,808**
2011	30,808	40,748	8,465	373	**80,394**
2012	35,558	40,701	8,719	428	**85,406**
2013	43,281	36,892	9,038	400	**89,611**
2014	33,092	36,896	10,601	474	**81,063**
2015	24,148	30,692	11,280	450	**66,570**
2016	31,130	28,849	11,839	507	**72,325**
2017	46,651	21,978	7,863	501	**76,993**
2018	41,999	26,467	11,515	352	**80,333**
2019	42,072	21,016	10,721	458	**74,267**
2020	48,196	16,769	12,033	468	**77,466**