Ventura County
Watershed Protection District
Water Resources Division

2021 Annual Report of Groundwater Conditions

Ventura County
Watershed Protection District
Water Resources Division

MISSION:

"Protect, sustain, and enhance
Ventura County watersheds now
and into the future for the benefit of
all by applying sound science,
technology, and policy."

2021 Annual Report of Groundwater Conditions

Cover Photo: Well Drilling in the Upper Ventura River Basin

Ventura County Watershed Protection District
Water Resources Division
Groundwater Section

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Executive Summary

Groundwater is the primary water source in Ventura County, providing approximately 63% of the total water for domestic, agricultural and industrial uses. Agricultural use accounts for the majority of groundwater consumption. The County provides protection for groundwater quality and supply through Well Ordinance No. 4468 by regulating the construction, maintenance, use and destruction of wells and engineering test holes (soil borings) in such a manner that the groundwater of the County will be of beneficial use without jeopardizing the health, safety or welfare of the people of Ventura County.

Water year 2021 saw average rainfall throughout the County. In January, the County was designated as an area of no drought but by the end of the year the designation had been changed by the U.S. Drought Monitor (http://droughtmonitor.unl.edu) to an area of moderate drought. The continued drought along with regulatory constraints led to a decrease in surface water releases and diversions. When less surface water is available, local groundwater demand increases. After continued drought conditions but with areas of average precipitation, groundwater elevations were mostly mixed compared with the previous spring. Nine of the key well levels had increased and seven showed a continuing decline.

Water quality trends within County basins were generally unchanged from previous years. Key water quality concerns in some basins continue to be high concentrations of total dissolved solids (TDS) and nitrate; both exceeding the maximum contaminant level (MCL) in localized areas within specific basins. Basin summary sheets included in the appendices include analyses of water level and water quality trends over a five-year period.

The County of Ventura does not regulate groundwater extractions. Reporting of extractions are regulated by two groundwater management agencies (GMAs) and a water conservation district in specific areas of the County: the Ojai Basin Groundwater Management Agency (OBGMA), the Fox Canyon Groundwater Management Agency (FCGMA), and United Water Conservation District (UWCD). These agencies cover approximately 8% of the land area in Ventura County. Well owners and operators within the statutory boundaries of an agency are required to report extractions to their respective agencies. Groundwater extractions outside of these boundaries are often unreported with total County-wide extractions unknown.

Several basins within the County have been designated as critically overdrafted by the California State Department of Water Resources (DWR). The Sustainable Groundwater Management Act (SGMA), which became effective in 2015, required Groundwater Sustainability Agencies (GSAs) be formed in all DWR-designated high and medium priority basins. GSAs exist in all high and medium priority basins within the County and are working (as of Dec. 2021) to develop, or have submitted, Groundwater Sustainability Plans (GSPs) to manage groundwater supplies. On November 22, 2021, the Department of water Resources approved the Fox Canyon Groundwater Management Agency Groundwater Sustainability Plans covering Oxnard and Pleasant Valley Basins. In 2014, the County passed Emergency Ordinance No. 4466. Section 4826.1 - Water Well and Water Well Permit Prohibitions (known as the Well Moratorium) temporarily bans, with some exceptions, issuance of permits for construction, modification or repair of existing wells. The emergency ordinance was established to protect groundwater after a spike in new well application submittals following SGMA legislation. The Well Moratorium will expire in a basin when its respective GSA submits the required GSP to the DWR. Some basins or areas may still be subject to new well moratoriums put in place by local agencies and cities.

This report provides a summary of Calendar Year 2021 water quality and groundwater elevations for the groundwater basins of Ventura County.

1.0 Introduction

The Ventura County Watershed Protection District (VCWPD) was formed on September 12, 1944, as the "Ventura County Flood Control District." Since 2003, it has been known as the VCWPD. The Groundwater Resources Section is part of the VCWPD and has collected groundwater data since 1928. Historically, groundwater data was published in Triennial or Quadrennial reports in a collaborative effort with the Flood Control District, Hydrology Section. The last such report was published in December 1986 and covered the years 1981 through 1984. Between 1985 and 2004, Groundwater Resources drafted several unpublished Groundwater Conditions Reports. In 2006, Groundwater Resources published its first *Groundwater Quality Report* for the years 2005 and 2006. The current report, *2021 Annual Report of Groundwater Quality Conditions*, is the 16th consecutive publication.

The purpose of this report is to provide information on groundwater conditions in Ventura County and to publish the results of the quarterly groundwater elevation measuring of approximately 200 wells and Fall groundwater quality sampling of water supply wells.

This report is prepared annually due to changing groundwater conditions and fluctuating seasonal conditions. Basin summary sheets in Appendix F provide a single-page summary of water level and quality trends along with other key data over a five-year period. Detailed water quality and water level data are presented for each basin. Laboratory analytical results and supporting data are included in the appendices.

Geography and County Information

Ventura County was formed on January 1, 1873, when it separated from Santa Barbara County and became one of 58 counties in the State of California. Geographically, the county includes 42 miles of coastline and the Los Padres National Forest, situated in the northern portion of the County, which accounts for 46% of the County's area. Fertile valleys and plains in the southern half of the County make it a leading agricultural producer. The County was ranked eleventh among California counties in total crop value in 2019[1] and eleventh among all Counties in the United States[2]. Together, farming and the Los Padres National Forest occupy half of the County's 1.2 million acres.

Population

The unincorporated areas, along with the ten incorporated cities of Camarillo, Fillmore, Moorpark, Ojai, Oxnard, Port Hueneme, Santa Paula, Simi Valley, Thousand Oaks, and San Buenaventura (Ventura), rank Ventura as the 13th most populous county in the State. On May 7, 2021, the California State Department of Finance estimated Ventura County's population to be 835,223, a decrease of 0.7 percent over the revised 2020 population estimate of 842,886. The City of Fillmore had the largest estimated percentage increase in population (1.6) while the City of Port Hueneme had a decrease of 1.4 percent over the previous year. Ventura County's population is expected to exceed 870,000 by the year 2030.

[1] California Department of Food and Agriculture *California Agricultural Statistics Review 2019-2020*
[2] Farm Bureau of Ventura County

2.0 County Well Ordinance

The first County Water Well Ordinance was adopted by the Ventura County Board of Supervisors in 1970 and has since undergone six revisions. The current Well Ordinance was last updated in December 2014 (No. 4468) to better align with SGMA.

The Well Ordinance provides for protection of groundwater quality and supply so that groundwater will be suitable and sustainable for beneficial use and not jeopardize the health of the people of Ventura County. This includes issuing well permits and inspecting the installation and destruction of wells. Quarterly water level measurements, annual water quality sampling, groundwater basins condition reporting, review of development projects, and provision of water quality and well information are carried out to better support the purpose of the Well Ordinance.

Permits

Permits are required for construction, repair, and destruction of groundwater wells, cathodic protection wells, monitoring wells, and geotechnical borings (engineering test holes). Permits are required to ensure wells and borings are constructed and sealed per California DWR Well Standards. Permits are issued throughout the County, except within the City of Oxnard which issues well permits within its city boundaries. A total of 90 permits for wells and engineering test holes were conditioned and issued during calendar year 2021.

Well Inspections

Per the Well Ordinance, well seals are inspected for each water supply well installation or destruction, cathodic protection well installation or destruction, and major modifications or repairs to existing water supply wells. A total of 38 inspections were performed in 2021.

Well Inventory and Status

The Groundwater Section maintains records in a database to make it more convenient to verify well locations, determine the well status (active, abandoned, destroyed), document well use (agricultural, domestic, municipal, cathodic protection), track well ownership, and verify parcel/ownership information.

The database contains details for various types of wells including water supply, long-term monitoring, cathodic protection wells and springs. Well information is organized and stored in the database by state well number. At the end of 2021 there were 9,366 well records in the database in the categories listed in **Table 2-1**.

Table 2-1**:** Inventory and Status of Wells

2021 Status	Number
Active	4,149
Abandoned	460
Can't Locate	1,830
Non-Compliant	53
Non-Compliant Abandoned	114
Destroyed	2,750
Exempt	10

- Active wells meet or exceed the minimum requirement of 8 hours pumping per calendar year as described in the County of Ventura Well Ordinance No. 4468.

- Abandoned wells do not meet the 8-hour minimum pumping requirement or are in a condition that no longer allows the well to be used.
- Can't Locate wells are usually old rural wells for which the Groundwater Section has historic well location data, but the locations may now be in areas that have subsequently been developed. There are several reasons why a well may be listed as "Can't Locate." The current owner of the property may be unaware of the existence of a well on their property or a County approved search has been conducted and no well has been found.
- Non-Compliant wells are generally active wells for which the responsible party failed to respond to written communication from the Groundwater Section.
- Non-Compliant Abandoned wells are classified as such when a well owner has failed to respond to written communication from the Groundwater Section to take action on an inactive well. The Well Ordinance prohibits anyone from owning an abandoned well. Abandoned wells pose a physical safety risk and may act as a potential conduit for contaminants to reach groundwater.
- Destroyed wells are wells that have been properly destroyed under permit.
- Exempt wells have been found to be in good enough condition to remain inactive for a period of five years before being re-activated or re-inspected. To be listed as exempt, a well inspection report from a licensed professional geologist or civil engineer must be submitted by the well owner to the Groundwater Section for review and approval.

3.0 Climate & Precipitation

The mean annual daily air temperature for 2021 at the National Weather Service Oxnard area office was 61.7 degrees Fahrenheit (ºF), with an average maximum high of 71.3 ºF and an average minimum low of 52.0 ºF[3]. The average annual rainfall, countywide was approximately 16.8 inches[4] for the 2021 water year[5]. Throughout the County, precipitation for the 2021 water year was less than 100% of normal. Moorpark received 95% of normal, while the Matilija Dam area received 73% of the normal rainfall total. **Figure 3-1** shows water year 2021 received rainfall totals and normal precipitation totals for that gauge/area. Averages are determined from the 1957-1992 base period, as this is a 35-year period that is representative of the long-term average for multiple sites in Ventura County[6]. **Figure 3-2** depicts average rainfall for the periods 2002 to 2021 for all of Ventura County. **Figure 3-3** shows a generalized distribution of rainfall across the County for water years with more precipitation (2010 and 2011) and **Figure 3-4** shows rainfall distribution for the last two water years (2020 and 2021).

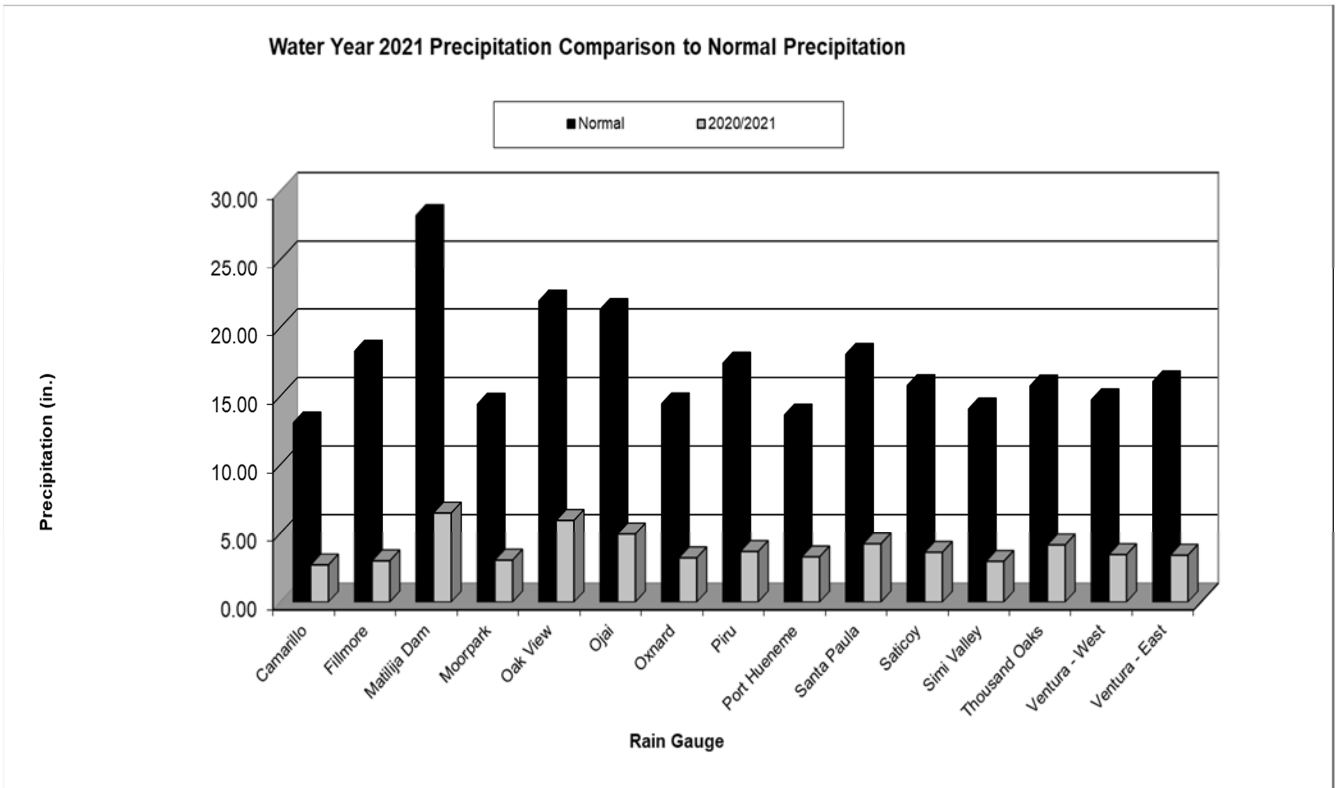


Figure 3-1: Water Year 2021 Precipitation and Normal Precipitation Totals

[3] Based on *preliminary* data from the National Climatic Data Center http://www.ncdc.noaa.gov.
[4] Based on *preliminary* data from all active rain gauges.
[5] Water Year defined as: October 1 to September 30 of the following year. VCWPD precipitation data is *preliminary* and subject to change.
[6] According to the Ventura County Hydrology Section's Historic Rainfall webpage.

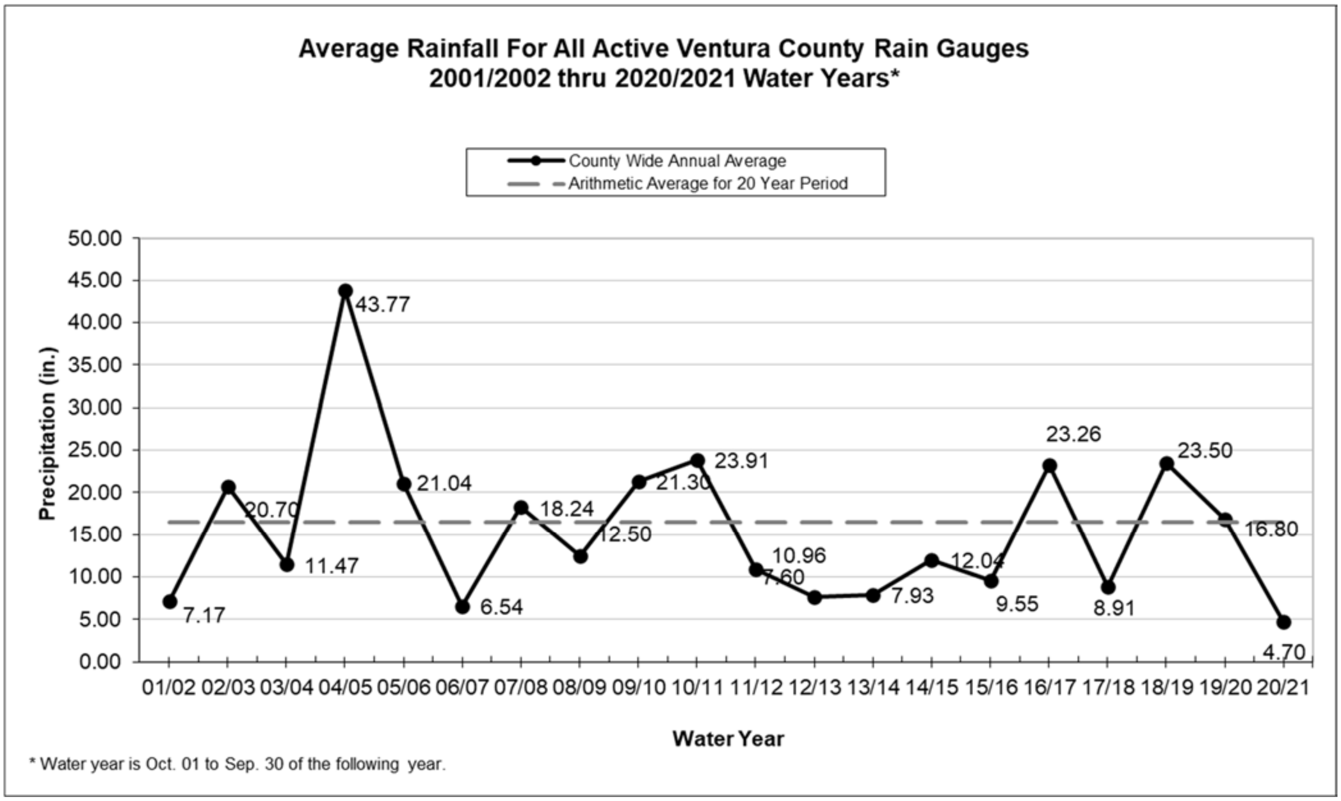


Figure 3-2: Average Annual Rainfall for Ventura County.

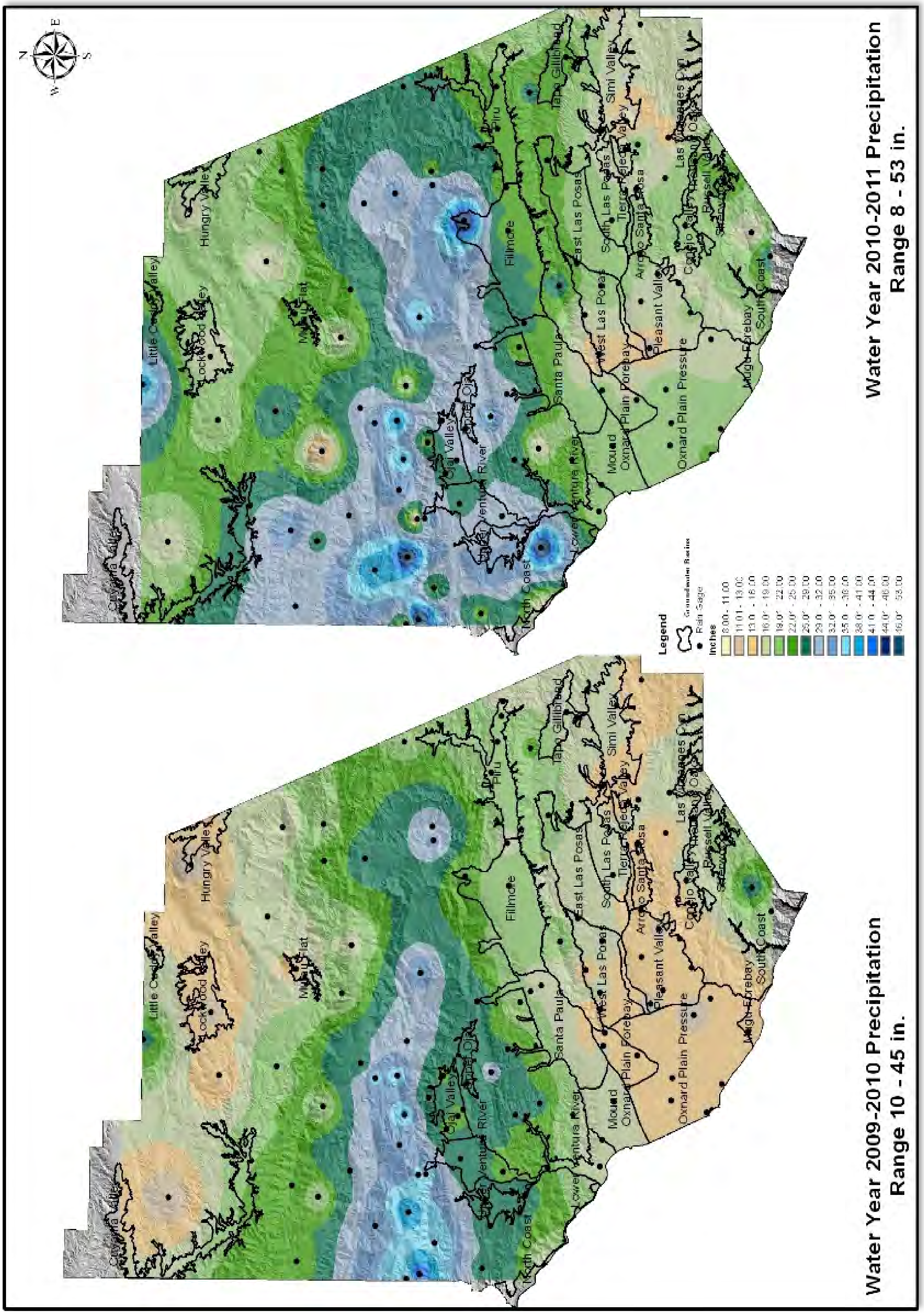
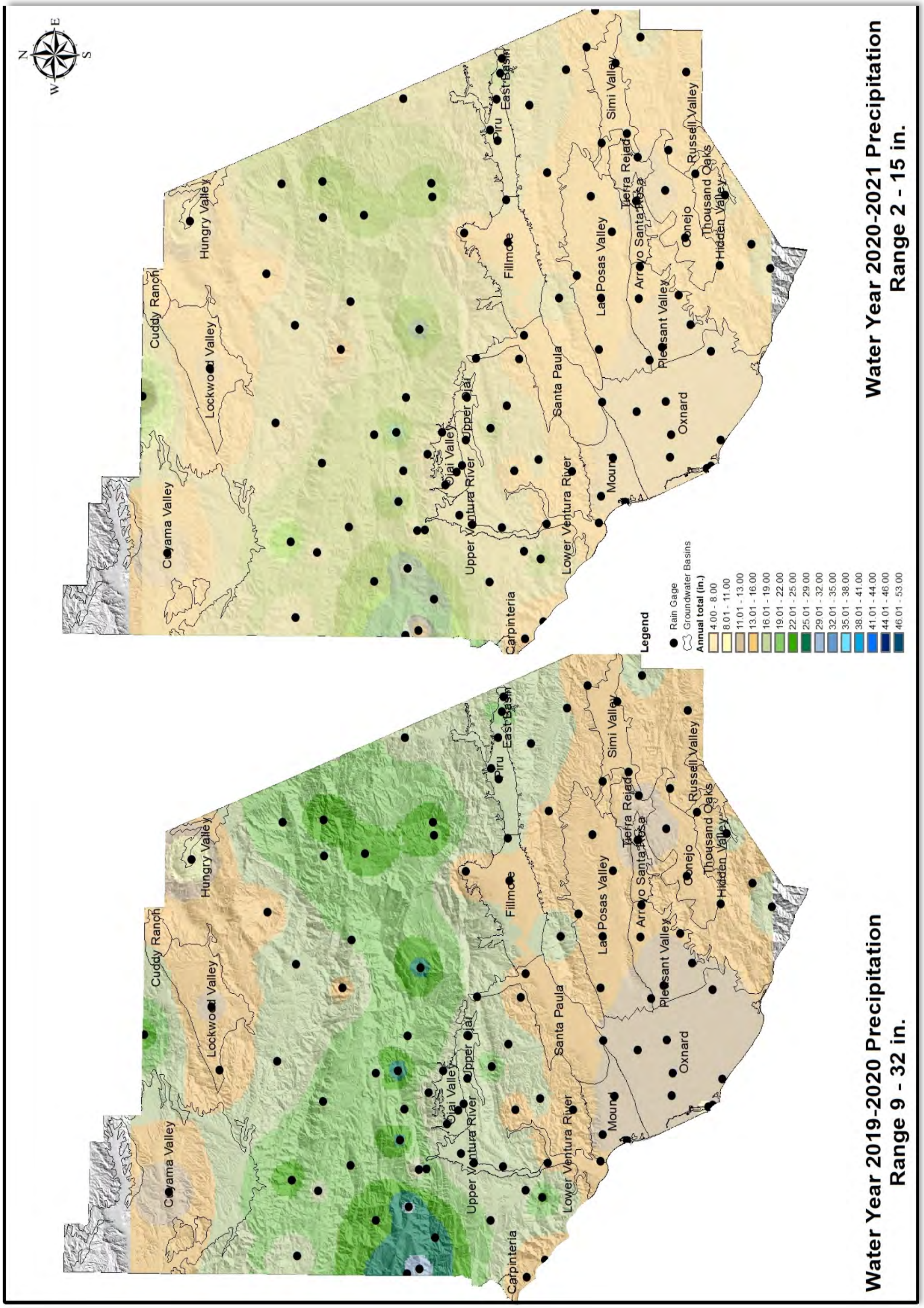


Figure 3-3: Precipitation Maps of Wet Years.



<u>Figure 3-4:</u> Precipitation Maps of Water Years 2020 and 2021

4.0 Groundwater

Groundwater is the primary source of water in Ventura County and accounts for approximately 63% of the total County water demand. Most accessible groundwater is found in the 28 groundwater basins and subbasins within the County (**Figure 4-1**). Groundwater basins in the northern half of the County do not join directly with other basins, while some groundwater basins in the southern half of the County are hydrologically continuous on the surface and in the subsurface to varying degrees.

The 23 basins and subbasins in the southern half of the County contain the largest groundwater reserves. These larger basins contain multiple confined and unconfined aquifers that can vary in thickness from ten to hundreds of feet. The aquifers are separated by relatively impermeable clay layers (aquitards) that create confined groundwater conditions. Detailed basin descriptions are provided in their respective section.

The Groundwater Resources Section of the VCWPD, the UWCD, individual water purveyors, and to a lesser extent the United States Geological Survey (USGS), all collect data to provide information regarding groundwater conditions within the County. Groundwater recharge occurs naturally from infiltration of rainfall and river/streamflow, artificially through injection of imported State Water Project water from Metropolitan Water District via Calleguas Municipal Water District (Calleguas) and spreading of diverted Santa Clara River water into recharge basins by UWCD.

Known groundwater extraction data within certain basins is presented later in this report and along with extraction estimations from other basins.

In annual reports prior to 2018 basin boundaries were delineated by the County of Ventura. After 2018 defined groundwater basins as shown in Department of Water Resources (DWR) Bulletin 118 (B118) are used for the Annual Report. DWR Bulletin 118 basin boundaries are used to align with other agencies and avoid confusion.

Basin sampling results are presented in alphabetical order by B118 basin name.

Figure 4-1: Ventura County Groundwater Basins Map

Groundwater Quality Characterization

Groundwater contains a variety of chemical constituents of varying concentrations. As water flows through an aquifer it acquires chemical compounds through interactions with surrounding alluvium or bedrock. For most groundwater, 95% of ions present are represented by a few major species. Positively charged cations include sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}). Negatively charged anions include chloride (Cl^-), carbonate (CO_3^{2-}), bicarbonate (HCO_3^-), and sulfate (SO_4^{2-}). These ionic species when added together account for most of the salinity that is commonly referred to as total dissolved solids (TDS). The Annual Report uses Piper and Stiff diagrams for the basic chemical characterization of groundwater.

Piper Diagram

A Piper diagram is a graph used to visualize the chemistry of a water sample. The diagram is comprised of three parts: a ternary diagram in the lower left representing the positively charged ions (cations), a ternary diagram in the lower right representing the negatively charged ions (anions), and a diamond plot in the middle representing a combination of the two (**Figure 4-2**). The diamond-shaped field between the triangles is used to represent the composition of water with respect to its anions and cations.

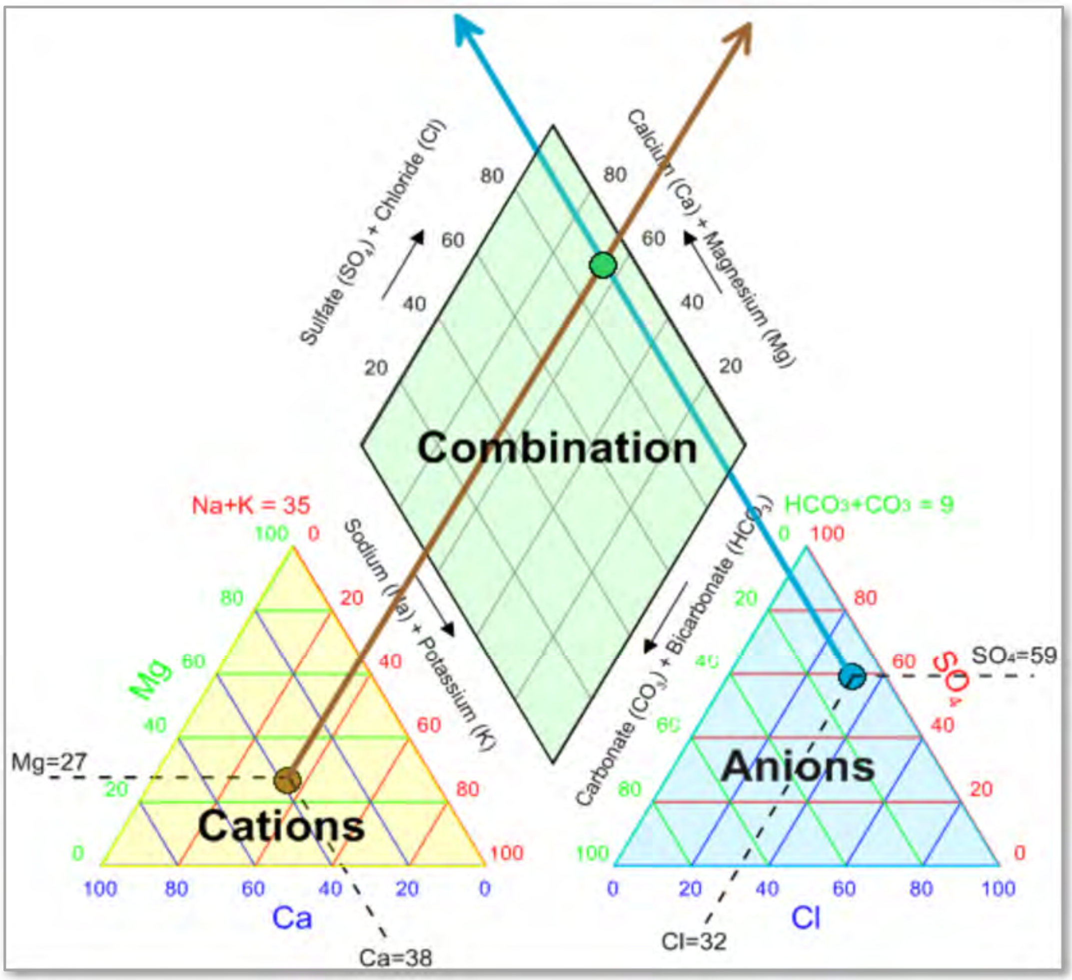


Figure 4-2: Example of a Piper Diagram

In the example diagram in **Figure 4-2** the cations plot in the mixed zone in the lower left triangle and the anions plot in the sulfate zone in the lower right triangle. The plotted points are projected onto the diamond-shaped center field and show that the water is calcium sulfate type.

Groundwater samples are interpreted as illustrated in **Figure 4-3**:

- top quadrant: calcium sulfate waters – typically associated with gypsum and mine drainage
- left quadrant: calcium bicarbonate waters – typically shallow, fresh groundwater
- right quadrant: sodium chloride waters – typically marine and ancient groundwater
- bottom quadrant: sodium bicarbonate waters – typically deep groundwater influenced by ion exchange

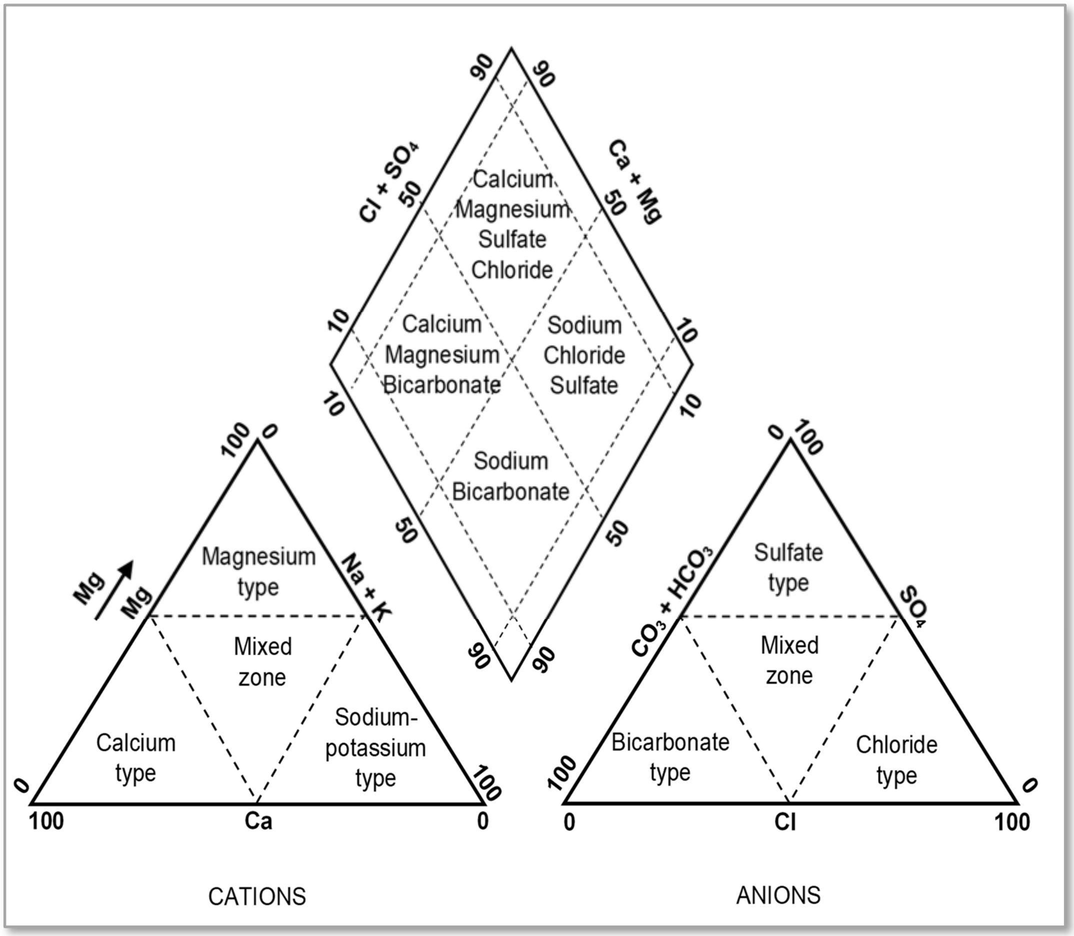


Figure 4-3: Piper Diagram with Water Types.

Figure 4-3 shows how a Piper diagram is used to characterize water quality. By grouping the anions (Cl^-, CO_3^{2-}, HCO_3^-, and SO_4^{2-}) into one group and cations (Na^+, K^+, Ca^{2+}, Mg^{2+}) into another group, the concentration of each anion and cation group can be calculated. The concentration of each anion or cation group in a sample is then converted to milliequivalents/L (meq/L) and then normalized on a percentage scale. The percent concentrations are then plotted on the lower ternary diagrams. The position of the points is projected parallel to the magnesium and sulfate axes, respectively, until they intersect in the center field (Fetter, 1988).

Piper diagrams for each basin are in **Appendix E**.

Stiff Diagram

A second method to present water quality results is through a Stiff diagram (**Figure 4-4**). The same cations and anions that are plotted in the piper diagrams are shown in the Stiff diagrams. The ions are plotted on either side of a vertical axis in milliequivalents per liter (meq/L), cations on the left of the axis and anions on the right. The polygonal shape created is useful in making a quick visual comparison of different water samples as waters with similar characteristics will display a similar shape. Stiff diagrams for wells sampled in 2021 are plotted on their respective basin map.

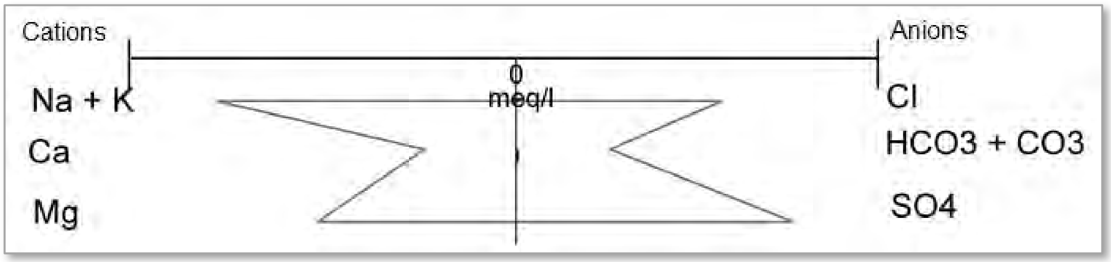


Figure 4-4: Example of Stiff Diagram.

Groundwater Quality Sampling

Water quality data is collected to assess groundwater quality within the County groundwater basins. Groundwater staff also work with and share groundwater quality data with other organizations and agencies in the County to maintain consistency in the countywide groundwater quality monitoring program. The data is also used by stakeholders, consultants, and other professionals. Water quality data is publicly available upon request by contacting the Watershed Protection District, Groundwater Resources Section.

Efforts are made to sample the same wells each year and add additional wells as time and budget allow. Wells sampled in the northern half of the County are shown in **Figure 4-5**. Wells sampled in the southern half of the County are shown in **Figure 4-6**.

Groundwater staff sampled a total of 183 water supply wells throughout the County in 2021. Well sampling procedures are outlined in the Groundwater Section's Groundwater Quality Sampling Plan. Well owners are provided a copy of the laboratory analytical report and notified if any of the constituents analyzed exceed the State and Federal established maximum contaminant levels (MCLs) for drinking water.

Laboratory analyses are conducted by Fruit Growers Laboratory in Santa Paula, a laboratory certified under the State Environmental Laboratory Accreditation Program. All water samples from wells were analyzed for general minerals, seven wells for Gross Alpha, and a random subset of 79 wells was selected for analysis of California Title 22 metals.

Water quality sampling results are included in **Appendix D**. Care should be taken when comparing data from past reports because wells sampled may vary annually. General interpretations of quality data are detailed in the following subsections.

Additional groundwater quality data is available from other sources, such as water districts and other agencies that collect and analyze groundwater. Organic groundwater chemistry data is also available for some areas of the County through the State Water Quality Control Board's Geotracker website for environmental cleanup sites
(https://geotracker.waterboards.ca.gov/).

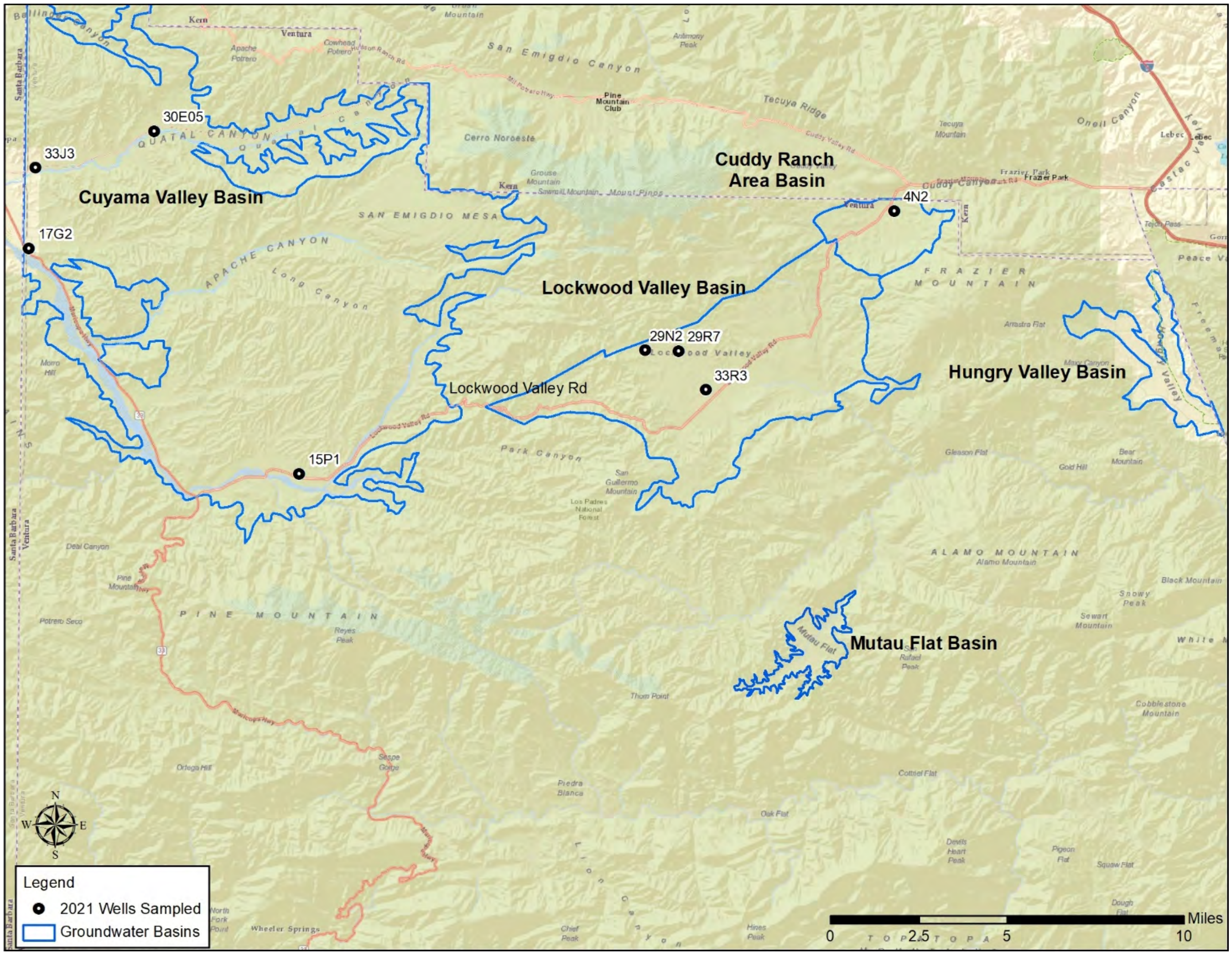


Figure 4-5: Location of Wells Sampled in Northern Half of the County.

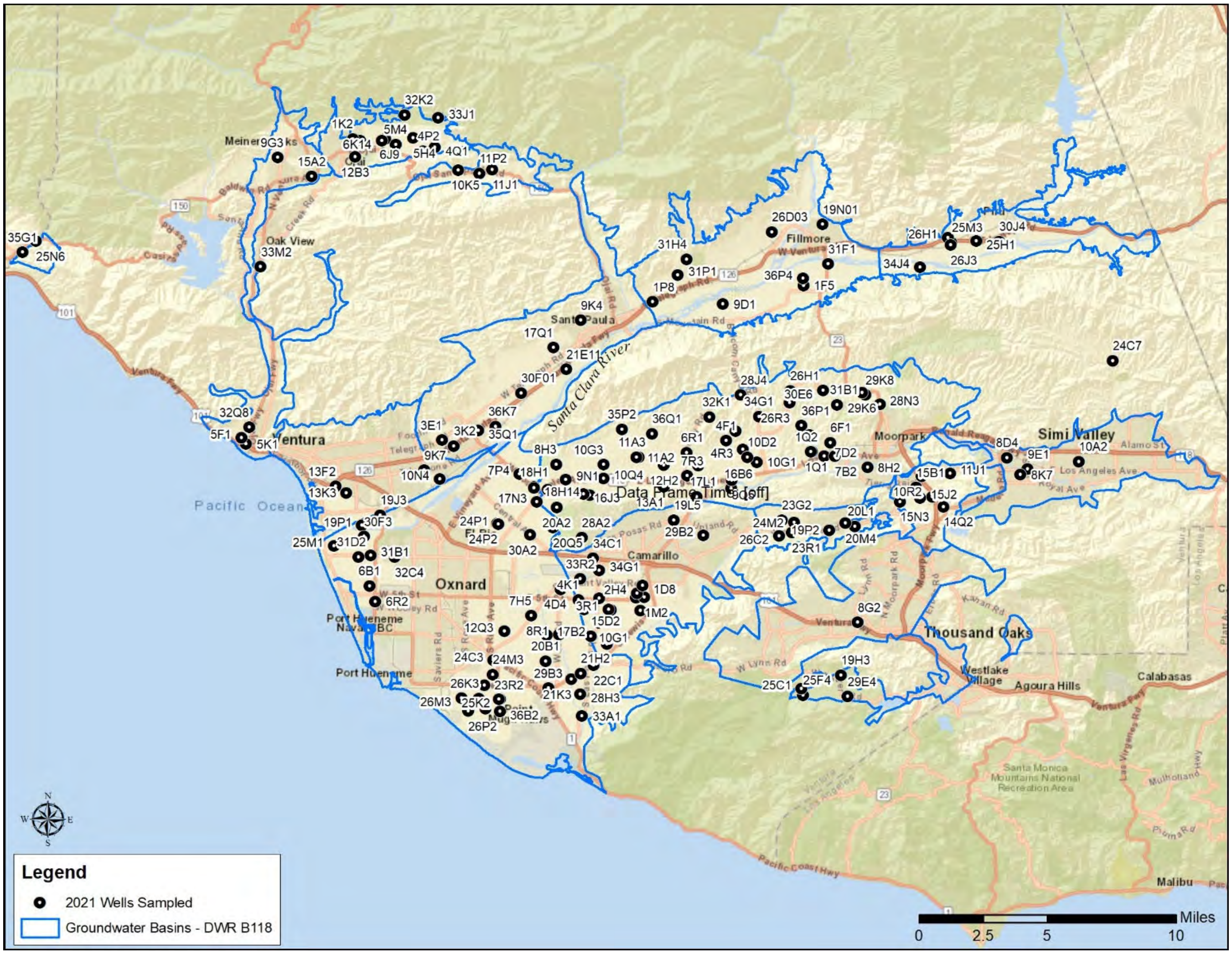


Figure 4-6: Location of Wells Sampled in Southern Half of the County.

Water Quality Standards

The Groundwater Resources Section uses Water Quality Standards established by the Los Angeles Regional Water Quality Control Board (LARWQCB) for assessing groundwater quality in Ventura County. Water Quality Standards provide for the reasonable protection and enhancement of surface and groundwater and consist of beneficial use and water quality objectives as mandated by the California Water Code (§13241).

LARWQCB developed twenty-four defined beneficial uses, all of which are compiled in the *Basin Plan for the Coastal Watersheds of Los Angeles and Ventura County* (Basin Plan). Water quality objectives protect public health by maintaining or enhancing existing or potential beneficial uses of water. The chart on the following page is an excerpt from the Basin Plan that shows the beneficial uses of groundwater for all basins in Ventura County.

The Basin Plan specifies Ventura County's narrative and numerical Water Quality Standards for groundwater and incorporates Title 22, California Code of Regulations (CCR) standards for groundwater by reference. These are referred to as primary MCLs. A primary MCL is the highest concentration of a contaminant allowed in drinking water that can be present without any adverse health effects. Primary

MCLs developed by the State meet or exceed the United States Environmental Protection Agency (EPA) standards and are legally enforceable standards.

Los Angeles Regional Quality Control Board Table of Beneficial Uses of Ground Water by Basin for Ventura County

DWR[ad] Basin No.	BASIN	MUN	IND	PROC	AGR	AQUA
	PITAS POINT AREA[ae]	E	E	P	E	
4-1	UPPER OJAI VALLEY	E	E	E	E	
4-2	LOWER OJAI VALLEY-OJAI VALLEY	E	E	E	E	
4-3	VENTURA RIVER VALLEY					
4-3.01	Upper Ventura	E	E	E	E	
4-3.02	Lower Ventura	P	E	P	E	
4-4	SANTA CLARA RIVER VALLEY[af]					
4-4.02	Oxnard					
4-4.02	Oxnard Forebay	E	E	E	E	
	Confined aquifers	E	E	E	E	
	Unconfined and perched aquifers	E	P		E	
4-4.03	Mound					
	Confined aquifers	E	E	E	E	
	Unconfined and perched aquifers	E	P		E	
4-4.04	Santa Paula					
	East of Peck Road	E	E	E	E	
	West of Peck Road	E	E	E	E	
4-4.05	Fillmore					
	Pole Creek Fan area	E	E	E	E	
	South side of Santa Clara River	E	E	E	E	
	Remaining Fillmore area	E	E	E	E	E
	Topa Topa (upper Sespe) area	P	E	P	E	
4-4.06	Piru					
	Upper area (above Lake Piru)	P	E	E	E	
	Lower area east of Piru Creek	E	E	E	E	
	Lower area west of Piru Creek	E	E	E	E	

DWR[ad] Basin No.	BASIN	MUN	IND	PROC	AGR	AQUA
4-6	PLEASANT VALLEY[ag]					
	Confined aquifers	E	E	E	E	
	Unconfined and perched aquifers	P	E	E	E	
4-7	ARROYO SANTA VALLEY[ag]	E	E	E	E	
4-8	LAS POSAS VALLEY[ag]	E	E	E	E	
4-9	SIMI VALLEY					
	Simi Valley Basin					
	Confined aquifers	E	E	E	E	
	Unconfined aquifers	E	E	E	E	
	Gillibrand Basin	E	E	P	E	
4-10	CONEJO VALLEY	E	E	E	E	
4-15	TIERRA REJADA	E	P	P	E	
4-16	HIDDEN VALLEY	E	P		E	
4-17	LOCKWOOD VALLEY	E	E		E	
4-18	HUNGRY VALLEY	E	P	E	E	
4-19	THOUSAND OAKS AREA[aj]	E	E	E	E	
4-20	RUSSELL VALLEY	E	P		E	
4-21	CONEJO-TIERRA REJADA VOLCANIC[ak]	E			E	

Footnotes are consistent for all beneficial use tables.

E: Existing beneficial use.

P: Potential beneficial use.

ac: Beneficial uses for ground waters outside of the major basins listed on this table and outlined in Fig 1-9 have not been specifically listed. However, ground waters outside of the major basins are, in many cases, significant sources of water. Further existing sources of water for downgradient basins, and such, beneficial uses in the downgradient basins shall apply to these areas.

ad: Basins are numbered according to DWR Bulletin No. 118-Update 2003 (DWR, 2003).

ae: Ground waters in the Pitas Point area (between the lower Ventura River and Rincon Point) are not considered to comprise a major basin and, accordingly, have not been designated a basin number by the DWR or outlined on Fig. 1-9.

af: Santa Clara River Valley Basin was formerly Ventura Central Basin and Acton Valley Basin was formerly Upper Santa Clara Basin (DWR, 1980).

ag: Pleasant Valley, Arroyo Santa Rosa Valley, and Las Posas Valley Basins were formerly subbasins of Ventura Central (DWR, 1980).

ah: Nitrite pollution in the groundwater of the Sunland-Tujunga area currently precludes direct MUN uses. Since the ground water in this area can be treated or blended (or both), it retains the MUN designation.

ai: Raymond Basin was formerly a subbasin of San Gabriel Valley and Monk Hill subbasin is now part of San Fernando Valley Basin (DWR, 2003). The Main San Gabriel Basin was formerly separated into Eastern and Western areas. Since these areas had the same beneficial uses as Puente Basin all three areas have been combined into San Gabriel Valley. Any ground water upgradient of these areas is subject to downgradient beneficial uses and objectives, as explained in Footnote ac.

aj: These areas were formerly part of the Russell Valley Basin (DWR, 1980).

ak: Ground water in the Conejo-Tierra Rejada Volcanic Area occurs primarily in fractured volcanic rocks in the western Santa Monica Mountains and Conejo Mountain areas. These areas have not been delineated on Fig. 1-9.

al: With the exception of ground water in Malibu Valley (DWR Basin No. 4-22) ground waters along the southern slopes of the Santa Monica Mountains are not considered to comprise a major basin and accordingly have not been designated a basin number by DWR.

am: DWR has not designated basins for ground waters on the San Pedro Channel Islands.

State MCLs for inorganic chemicals (Title 22 Metals) and their potential health effects are listed in **Table 4-1**. The EPA MCLs are listed for informational purposes but are not used to describe groundwater quality in this report. State and EPA Primary MCLs for radionuclides are listed in **Table 4-2**.

The Basin Plan also states that groundwater shall not contain “taste or odor-producing substances” that “cause nuisance or adversely affect beneficial uses.” These are known as secondary MCLs (**Table 4-3**). Secondary MCLs do not pose a threat to human health and are set to a level at which most people will physically notice their presence in drinking water. Secondary MCLs assist in managing drinking water for aesthetic considerations (taste, odor and color) and are enforceable standards in California.

Table 4-1: Primary Maximum Contaminant Levels for Title 22 Metals.

Primary Contaminants	Chemical Formula	EPA MCL[1] (mg/L)[2]	CCR, Title 22 MCL (mg/L)	Potential Health Effects
Aluminum	Al	not established	1.0	Unknown. Some studies show exposure to high levels may cause Alzheimer's, but other studies show this not to be true.
Antimony	Sb	0.006	0.006	Increase in blood cholesterol; decrease in blood sugar
Arsenic	As	0.01	0.01	Skin damage or problems with circulatory systems and potential increased risk of developing cancer.
Asbestos	various	7 MFL[3]	7 MFL	Increased risk of developing benign intestinal polyps.
Barium	Ba	2	1	Increase in blood pressure.
Beryllium	Be	0.004	0.004	Intestinal lesions.
Cadmium	Cd	0.005	0.005	Kidney damage.
Chromium	Cr	0.1	0.05	Allergic dermatitis.
Copper	Cu	1.3	1.3	Short term exposure: Gastrointestinal distress. Long term exposure: Liver or kidney damage
Cyanide (as free cyanide)	CN^-	0.2	0.15	Nerve damage or thyroid problems.
Fluoride	F^-	4	2	Bone disease (pain and tenderness of the bones); Children may get mottled teeth.
Lead[4]	Pb	0.015	0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities. Adults: Kidney problems; high blood pressure.
Mercury	Hg	0.002	0.002	Kidney damage.
Nickel	Ni	not established	0.1	Allergic contact dermatitis most common.
Nitrate (as Nitrogen) NO_3^-	N	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.
Nitrate[5]	NO_3^-	Listed as Nitrate-N	45	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.

Primary Contaminants	Chemical Formula	EPA MCL[1] (mg/L)[2]	CCR, Title 22 MCL (mg/L)	Potential Health Effects
Nitrite (as Nitrogen) NO_2^-	N	1	1	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.
Selenium	Se	0.05	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems.
Thallium	Tl	0.002	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems.

[1]MCL = Maximum Contaminant Level.

[2]mg/L = milligrams per liter.

[3]MFL = Million fibers per liter, with fiber length >10 microns.

[4]Regulatory action level.

[5]CCR, Title 22 standard for Nitrate reported as NO_3

Table 4-2: Primary Maximum Contaminant Levels for Radionuclides

Radionuclide	Chemical Formula	CCR, Title 22 MCL[1]	EPA MCL	Potential Health Effects
Gross Alpha particle activity (excluding radon and uranium)	none	15 pCi/L	15 pCi/L[2]	Toxic kidney effects, risk of cancer.
Gross Beta particle activity	none	50 pCi/L 4 millirem/yr	4 millirem/yr[3]	
Radium-226	Ra-226	5 pCi/L	5 pCi/L [4]	
Radium-228	Ra-228	5 pCi/L	combined with Radium-226	
Strontium-90	Sr	8 pCi/L	covered under gross beta	
Tritium	3H	20,000 pCi/L	covered under gross beta	
Uranium	U	20 pCi/L	30 µg/L[5] (~20 pCi/L)	

[1] MCL = Maximum Contaminant Level.

[2] pCi/L = picocurie per liter. One pCi is one trillionth of a Curie, 0.037 disintegrations per second, or 2.22 disintegrations per minute.

[3] Gross beta MCL is 4 millirems/year annual dose equivalent to the total body or any internal organ; Sr-90 MCL = 4 millirem/year to bone marrow; tritium MCL = 4 millirem/year to total body.

[4] EPA MCLs combine radium-226 and radium-228.

[5] µg/L = micrograms per liter, can be converted to pCi/L by multiplying by 0.67

Table 4-3: Secondary Maximum Contaminant Levels

Secondary Contaminants	Chemical Formula	EPA MCL[1] (mg/L)[2]	CCR, Title 22 MCL (mg/L)	Noticeable Effects
Aluminum	Al	0.5 to 0.2	0.2	Colored water.
Chloride	Cl^-	250	250	Salty taste.
Color[3]	--	15[3]	15	Visible tint.
Copper	Cu	1.0	15	Metallic taste; blue-green staining.
Corrosivity	--		not established	Metallic taste; corroded pipes/ fixtures staining.
Fluoride	F^-	2.0	not established	Tooth discoloration
Foaming Agents	--	0.5	0.5	Frothy, cloudy; bitter taste; odor.
Iron	Fe	0.3	0.3	Rusty color; sediment; metallic taste; reddish or orange staining.
Manganese	Mn	0.05	0.05	Black to brown color; black staining; bitter metallic taste.
Odor[4]	--	3 TON[4]	3 TON	"Rotten-egg" smell, musty or chemical smell.
pH	--	6.5-8.5	not established	Low pH: bitter metallic taste; corrosion. High pH: slippery feel; soda taste; salt deposits.
Silver	Ag	0.1	0.1	Skin discoloration; graying of the white part of the eye.
Specific Conductance[5]	--	not established	900[5]	Unpleasant taste or odor; gastrointestinal distress.
Sulfate	SO_4^{2-}	250	250	"Rotten-egg" smell, iron and steel corrosion or "black water"; can discolor silver, copper and brass utensils.
Total Dissolved Solids (TDS)	--	500	200	Hardness; deposits; colored water; staining; salty taste.
Zinc	Zn	5.0	5.0	Metallic taste.

[1] MCL = Maximum Contaminant Level.
[2] mg/L = milligrams per liter.
[3] Units are in color numbers.
[4] Units are in TON = Threshold Odor Number
[5] Units are in Siemens per centimeter = S/cm.

5.0 Current Sampling Results by Basin

This section presents general interpretations of the groundwater quality data for each basin sampled this year. Data interpretation is limited to the samples collected by County staff, unless otherwise noted. This annual report includes a summary table of water quality analyses for nitrate, TDS, sulfate, chloride, and boron for each basin. These mineral constituents have specific numerical objectives that vary between each basin and in some cases for localized areas within a basin. Presentation of the data in this format allows for comparison with the numerical mineral quality objectives outlined in **Table 5-1** in the Basin Plan.

Table 5-1: Example of summary table.

Criteria	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
Primary MCL	45	none	none	none	none
Secondary MCL	none	500	250	250	none

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL.

In general, Ventura County groundwater has high TDS and sulfate. The Piper Diagram (**Figure E-1**) shows water quality for all wells sampled in the County this year. County-wide there is moderate variation in water quality; calcium is the dominant cation and sulfate is the dominant anion. The most common water type is calcium sulfate.

Arroyo Santa Rosa Valley Basin (DWR Basin No. 4-007)

The water-bearing units of the Arroyo Santa Rosa Basin occupy almost the entire area beneath the Santa Rosa Valley. The area west of the Bailey Fault is generally considered hydrogeologically separate from the area east of the fault, although some leakage across the fault does occur (Camrosa, 2013). The location of the fault is inferred primarily from water well data (Camrosa, 2013). Depth to water-bearing material is approximately 50 feet below ground surface (bgs). The water-bearing units west of the fault are confined and those located east of the fault are unconfined. The degree of groundwater movement across the fault is not clearly understood. The main water-bearing units in the basin consist of alluvium and parts of the San Pedro Formation, which can reach a thickness of up to 700 feet in the eastern portion of the basin. The major hydrologic features are the Conejo Creek and its tributary, Arroyo Santa Rosa, which drain surface waters westward toward the Pacific Ocean.

The basin is dominated by an east-trending syncline that folds the San Pedro and Santa Barbara Formations, directing water into the more permeable San Pedro Formation. The Santa Rosa fault zone places the less permeable Sespe and Topanga Formations against the San Pedro Formation, creating a barrier to groundwater flow into the basin from the north and is likely responsible for the difference in water levels in the western part of the basin (CSWRB, 1956).

Land use in the area overlying the basin consists principally of agriculture and rural residential development on large lots. Much, if not all, of the area overlying this basin is unsewered with a high number of individual septic systems. Sources of nitrate to groundwater include septic systems, agricultural fertilization, and animal keeping. A large portion of recharge to the basin is discharge from the City of Thousand Oaks' Hill Canyon Wastewater Treatment Plant.

There are 85 water supply wells in the Arroyo Santa Rosa Valley Basin of which 37 are active. The Piper diagram (**Figure E-2**) shows low variation in water quality of wells sampled in 2021. There is no dominant cation, but the samples plot close to the magnesium cation type. The dominant anion for four samples is bicarbonate anion type; the remainder have no dominant anion. Six water samples are magnesium bicarbonate type, and one is sodium chloride type.

Selected water quality results are presented in **Table 5-2**. Water from four of the seven wells sampled had nitrate concentrations higher than the primary MCL. All seven wells had TDS concentrations above the secondary MCL ranging from 760 to 1,060 mg/l. Chloride concentrations in eight wells were above the level that can impair agricultural beneficial uses for sensitive plants. However, they were not above the MCL. Two samples were analyzed for Title 22 metals. None were above the primary MCL.

The Piper diagram in **Figure E-3** shows a comparison of groundwater chemistry between Tierra Rejada Basin and the Arroyo Santa Rosa Valley Basin. The water chemistry is similar but with more variation in the Tierra Rejada samples. **Figure 5-1** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-2: Selected water quality results for the Arroyo Santa Rosa Valley Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
19P2	10/4/2021	**63.1**	**760**	111	108	0.2
20L1	12/1/2021	**74.5**	**950**	175	104	0.2
20M4	10/4/2021	25.9	**800**	128	137	0.1
23G3	11/18/2021	**87.4**	**800**	95	132	0.1
23R1	10/4/2021	**80.8**	**1010**	200	179	0.3
24M2	10/4/2021	6.1	**820**	76.2	215	0.2
26C2	10/4/2021	**74.2**	**1060**	218	169	0.3

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

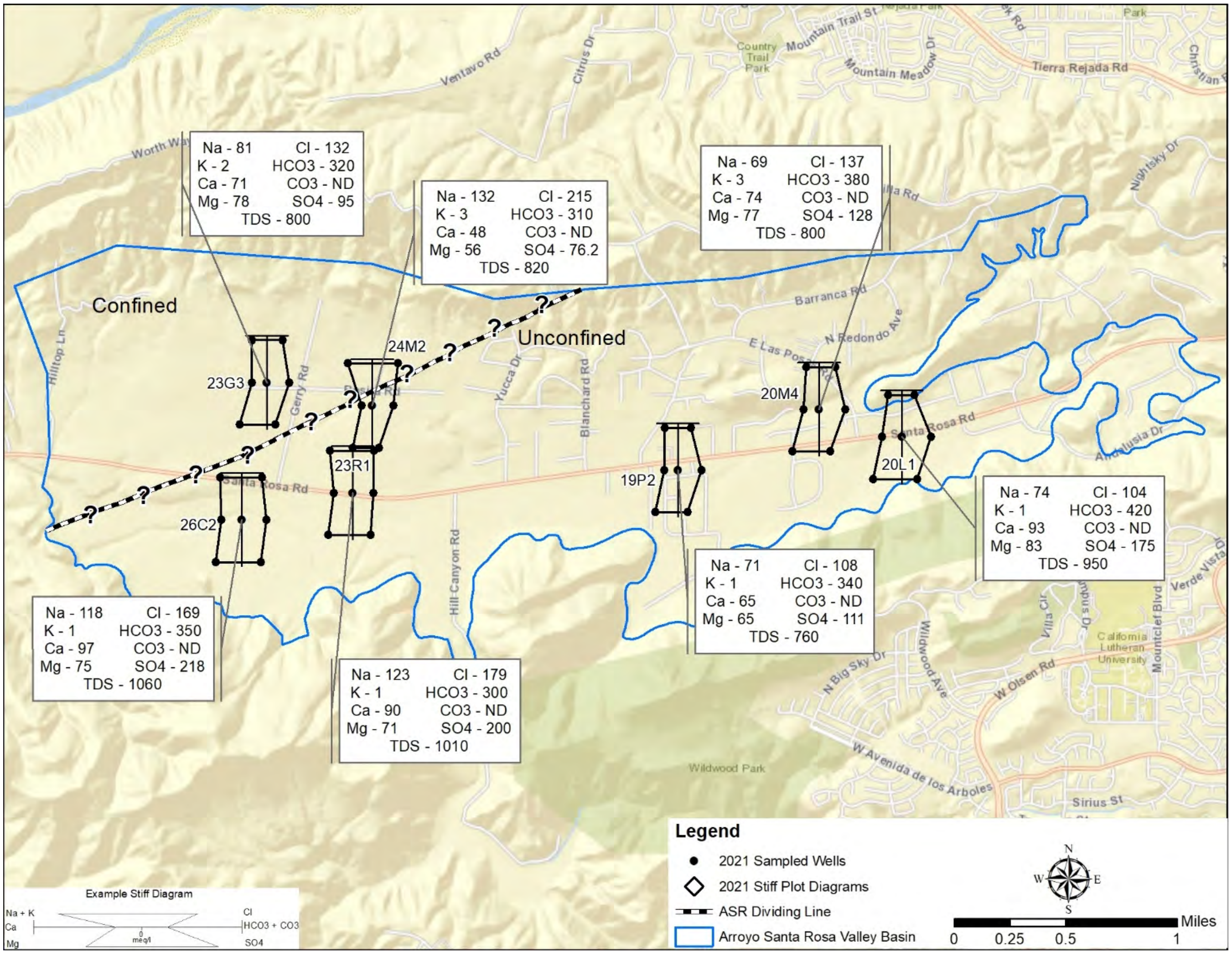


Figure 5-1: Arroyo Santa Rosa Valley Basin wells sampled with Stiff diagrams and selected inorganic constituents.

Figure 5-2 shows the geographic distribution of wells sampled in 2021, with graduated symbols representing nitrate concentrations. **Figure 5-3** shows nitrate results for 2012 through 2021 in the same manner. The Arroyo Santa Rosa Basin has been nitrate-impacted for many years. Current sampling results exceed the state MCL of 45 mg/L in four of five wells. Management practices in the Ventura County Non-Coastal Zoning Ordinance (NCZO) were established to mitigate nitrate impacts. These include limiting the number of large animals kept and restricting on-site septic systems. Camrosa blends well water pumped from the basin with imported water to reduce nitrate concentrations below the MCL. None of the groundwater samples collected this year had a nitrate (NO_3) concentration above 100 mg/L. In previous years nitrate concentrations have been as high as 292 mg/L.

ARROYO SANTA ROSA VALLEY BASIN
2021 Nitrate Concentrations

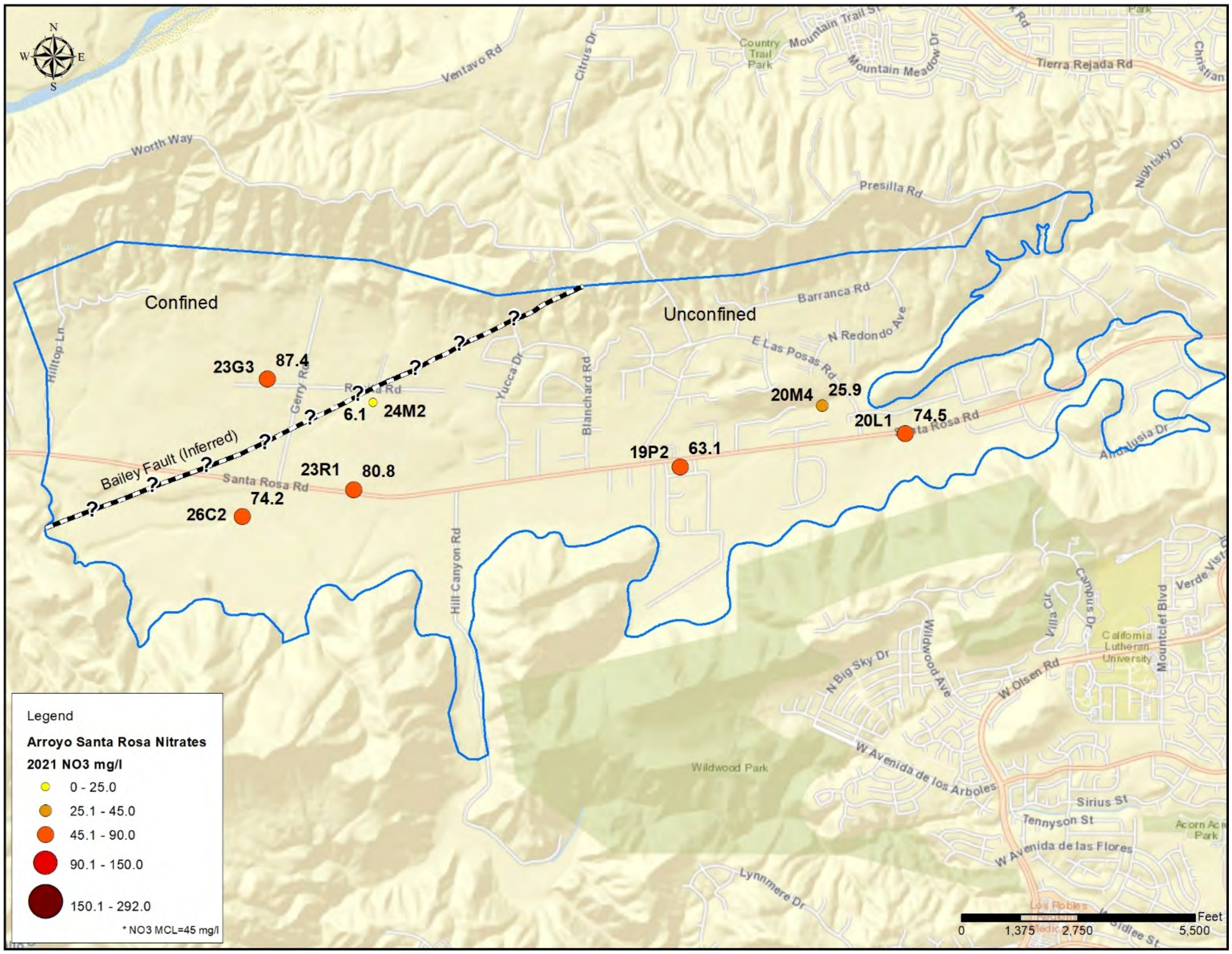


Figure 5-2: Arroyo Santa Rosa Valley Basin nitrate concentrations for 2021.

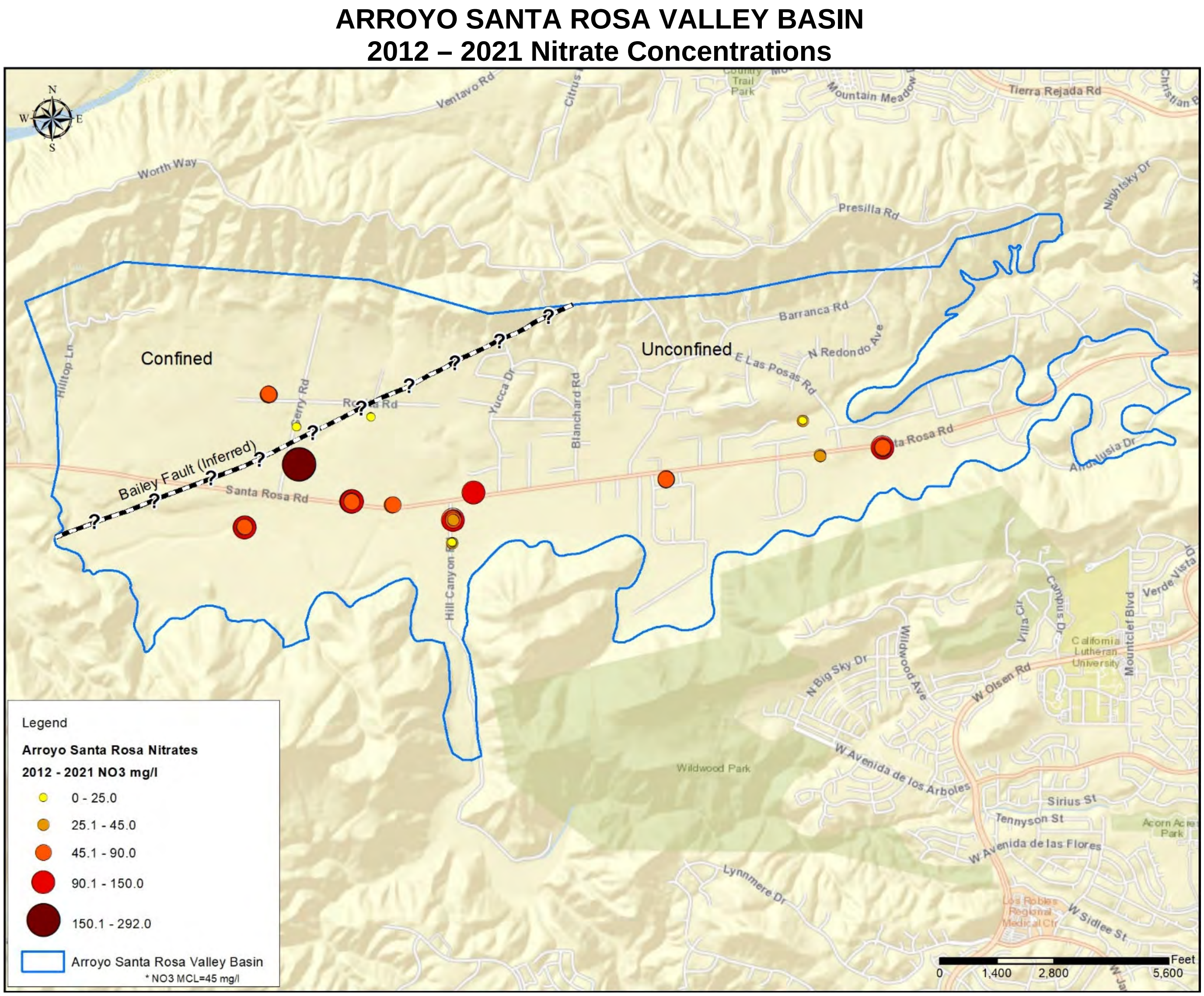


Figure 5-3: Arroyo Santa Rosa Valley Basin nitrate concentrations for 2012 – 2021.

Carpinteria Basin (DWR Basin No. 3-018)

Previous annual reports used the North Coast Basin boundary (a County of Ventura-defined area) for wells in the very western extent of the County. DWR Bulletin 118 designates this part of the County as the Carpinteria Basin and the DWR designation is used in this annual report. The Ventura County portion of the basin consists of narrow, thin strips of permeable sediments and marine terrace deposits along the coastline from Rincon Creek to just northwest of the Ventura River. There are 17 water supply wells in the Ventura County portion of the basin, of which only 4 are active and primarily located in the northwestern area along Rincon Creek. Water samples were collected from two wells at the northwestern end of the Ventura County portion of the basin. The Piper diagram in **Figure E-4** shows little variation in the water quality of wells sampled in 2021. There is no dominant cation, though both samples plot close to the calcium type. There is no dominant anion. One sample plots close to the sulfate type, and one plots close to the bicarbonate type. The water in both samples is calcium bicarbonate type.

Both samples had TDS and sulfate concentrations above the secondary MCL (**Table 5-3**). **Figure 5-4** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate. One sample was analyzed for Title 22 metals. None of the constituents was above the MCL.

Table 5-3: Selected water quality results for the Carpinteria Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
25N6	10/21/2021	27.5	**1090**	**319**	108	0.3
35G1	10/21/2021	27.7	**1100**	**314**	107	0.3

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

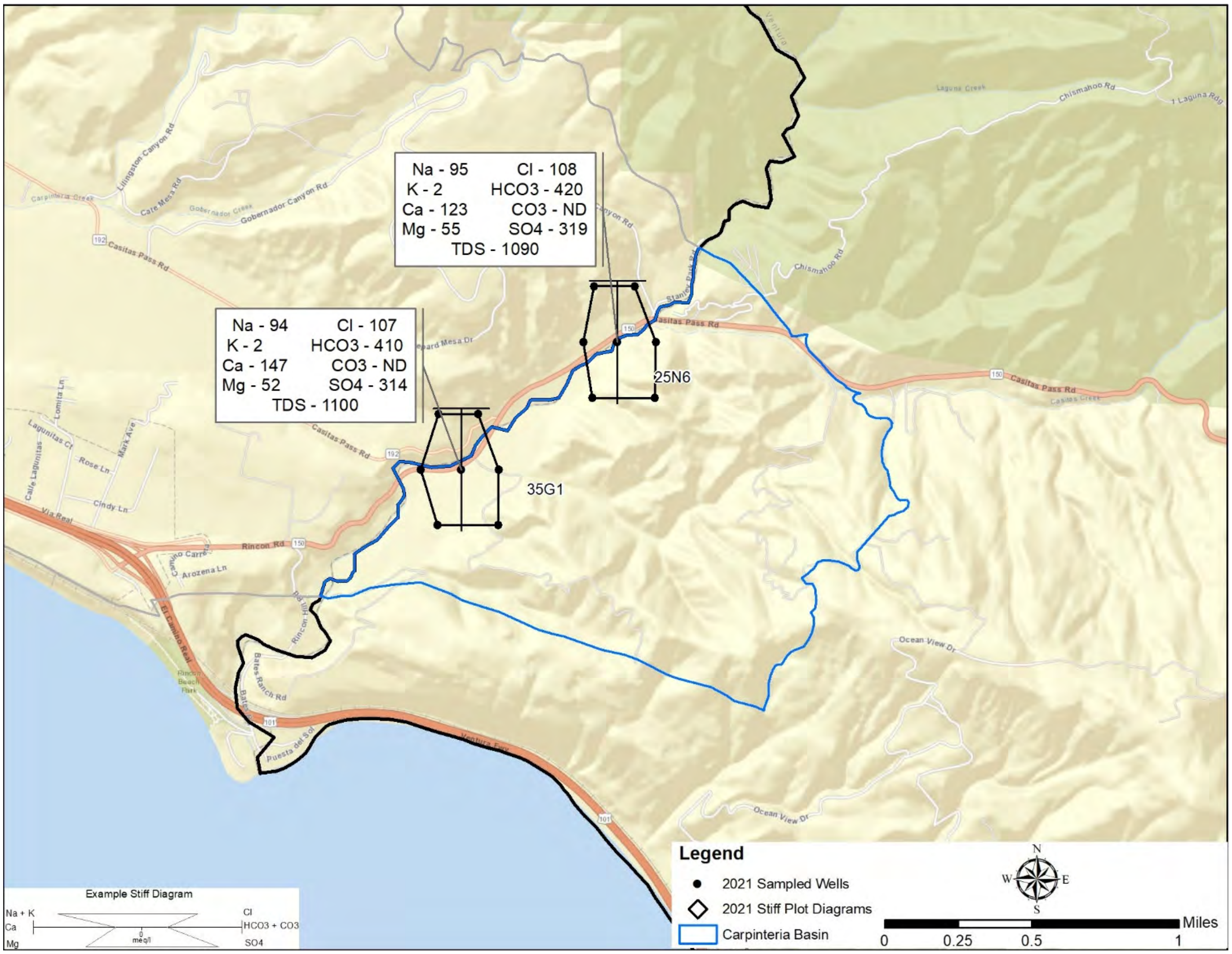


Figure 5-4: Carpinteria Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Conejo Basin (DWR Basin No. 4-010)

The Conejo Basin has few active water wells available for sampling. The depth to groundwater averages about 50 feet bgs. The water-bearing units in the basin are Quaternary alluvium and the Modelo, Topanga and Conejo Formations. The quaternary alluvium is generally only a few feet thick except near Newbury Park and Thousand Oaks where it can reach up to 60 feet in thickness; however, the alluvium is not the main water-bearing unit in the basin. The Miocene age Topanga and Conejo Formations are coeval and intercalated, or the same age and interbedded. Within the Conejo Basin area, the Topanga formation contains sandstone, conglomerate and shale. The Conejo Formation consists of volcanic tuff, debris flow, and basaltic flow and breccia deposits that reach 13,000 feet thick. The high porosity of the fractured basaltic flows allows production from these units. There are approximately 432 wells in the Conejo Basin of which 61 are active water supply wells. One well from within the basin was sampled in 2021. The Piper diagram in **Figure E-22** shows little change in the water quality of the well sampled from 2020. The water in the sample is magnesium sulfate type.

The sample had TDS and sulfate concentrations above the secondary MCL (**Table 5-4**). **Figure 5-5** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate. The sample was analyzed for Title 22 metals. None of the constituents were above the primary MCL.

Table 5-4: Selected water quality results for the Conejo Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
8G2	09/23/2021	ND	**1350**	**478**	133	0.1

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

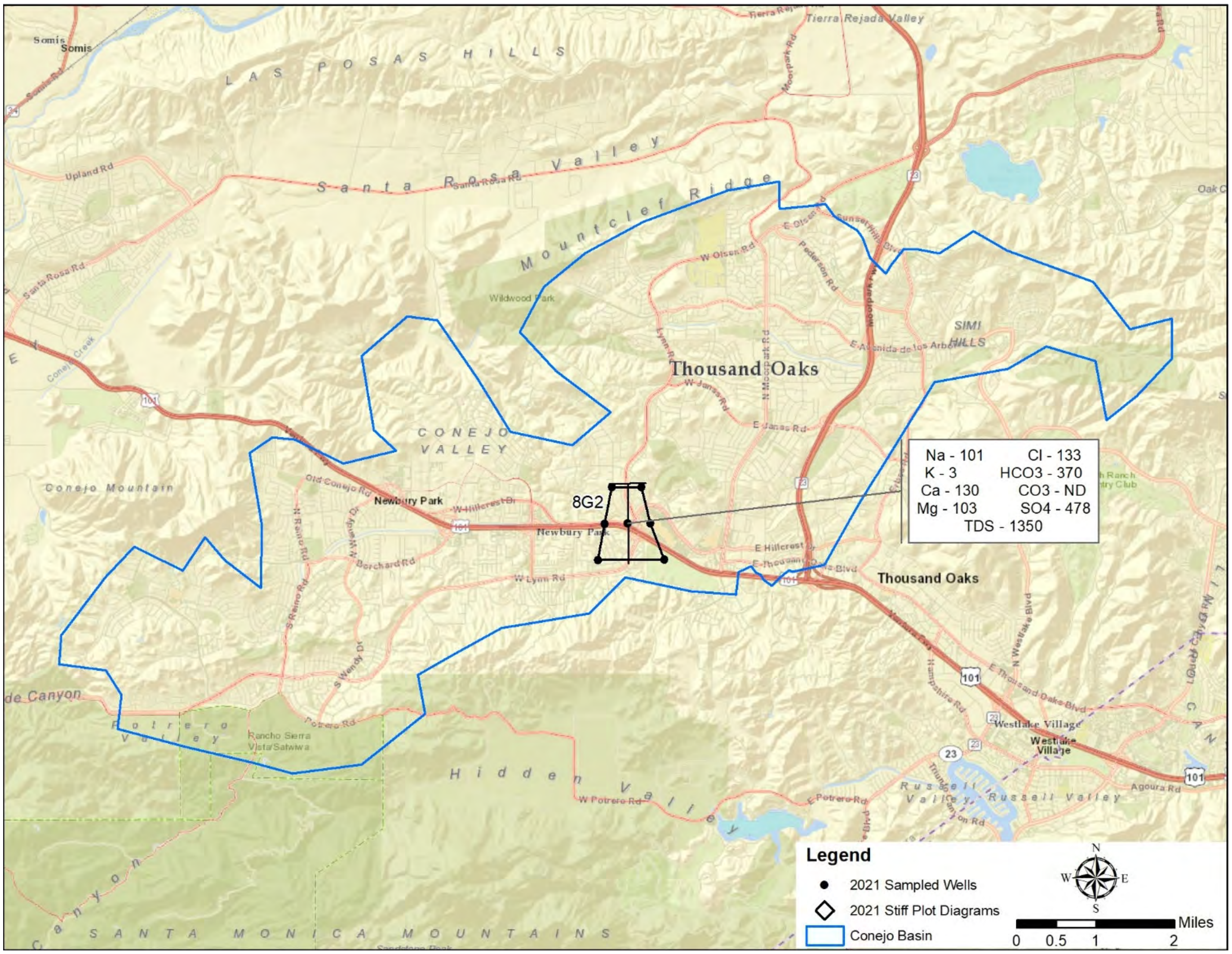


Figure 5-5: Conejo Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Cuddy Ranch Area Basin (DWR Basin No. 5-083)

The Cuddy Ranch Area Basin is in the northeastern part of Ventura County near the boundary of Kern County. Two faults contribute to the formation of the basin. The east-west trending San Andreas fault zone and Tecuya Mountain bound the north portion. The southwest trending Big Pine Fault and associated splays bound and underlie the southern portion of the basin. The portion of the basin adjacent to the Big Pine Fault zone is locally known as Little Cuddy Valley. Groundwater sampling has been limited to the Little Cuddy Valley portion of the basin. Water-bearing units consist of recent alluvial sand and gravel overlying shallow bedrock, permeable sands and gravels in the Quaternary and Tertiary sandstones, and highly fractured igneous or metamorphic rocks. Depth to water-bearing material is approximately 20 to 30 feet. Historically, groundwater quality has been considered very good. There are approximately 25 water supply wells in the Little Cuddy Valley Basin of which 18 are active. One well was sampled in the basin in 2021. The Piper diagram in **Figure E-23** shows little change in the water quality of the well sampled from previous years. The water in the sample is calcium bicarbonate type.

The sample had TDS and sulfate concentrations above the secondary MCL (**Table 5-5**). **Figure 5-6** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate. The sample was analyzed for Title 22 metals. None of the constituents were above the primary MCL.

Table 5-5: Selected water quality results for the Conejo Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
4N2	11/12/2021	1.7	350	18	15	ND

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

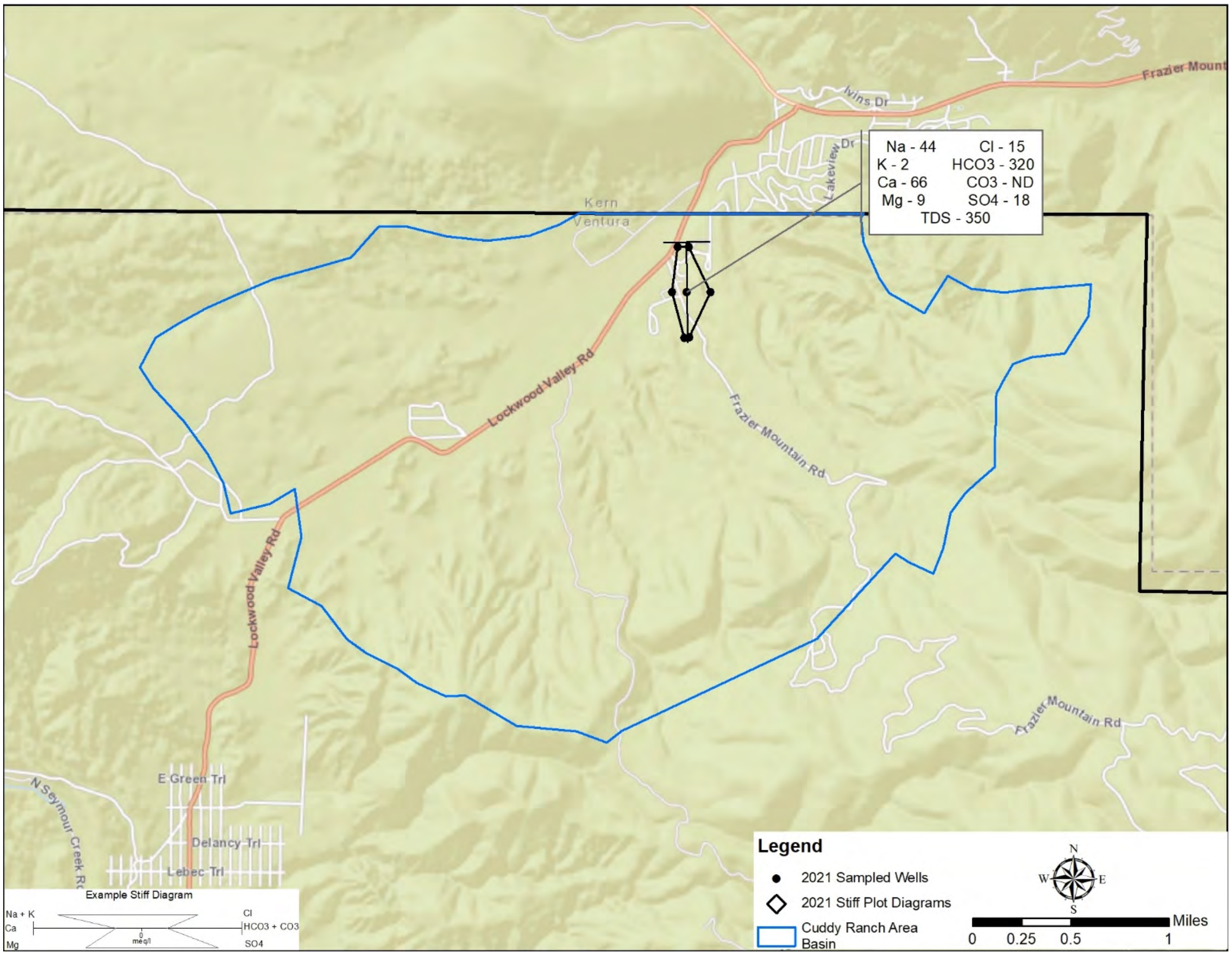


Figure 5-6: Cuddy Ranch Area Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Cuyama Valley Basin (DWR Basin No. 3-013)

The Cuyama Valley Basin is in a remote area in northwestern Ventura County. The map in **Figure 5-7** shows only the portion of the basin that is in Ventura County. There are approximately 140 water supply wells in the Basin, of which 102 are active. Depth to the main water-bearing unit varies between 40 to 170 feet bgs. Four wells were sampled in the basin in 2021. The Piper diagram in **Figure E-24** shows moderate variability in water quality of the wells sampled in 2021. Calcium is the dominant cation in the sample. Sulfate is the dominant anion in the sample. The water in one sample is calcium sulfate type, one sample is sodium chloride type, and the remaining samples are sodium bicarbonate type. One water sample was analyzed for Title 22 metals. No constituents were above the MCL (**Table 5-5**)

The samples all had TDS concentrations above the MCL. One sample had sulfate and one had chloride concertation above the secondary MCL (**Table 5-6**). **Figure 4-7** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate. The sample was analyzed for Title 22 metals. None of the constituents were above the primary MCL.

Table 5-6: Selected water quality results for the Cuyama Valley Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
15P1	10/27/2021	3.4	**2090**	**1020**	8	0.2
30E05	10/27/2021	5.9	**1100**	215	**251**	0.7
33J03	10/27/2021	10.3	**860**	197	110	0.4
17G02	11/12/2021	ND	**740**	206	106	0.4

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

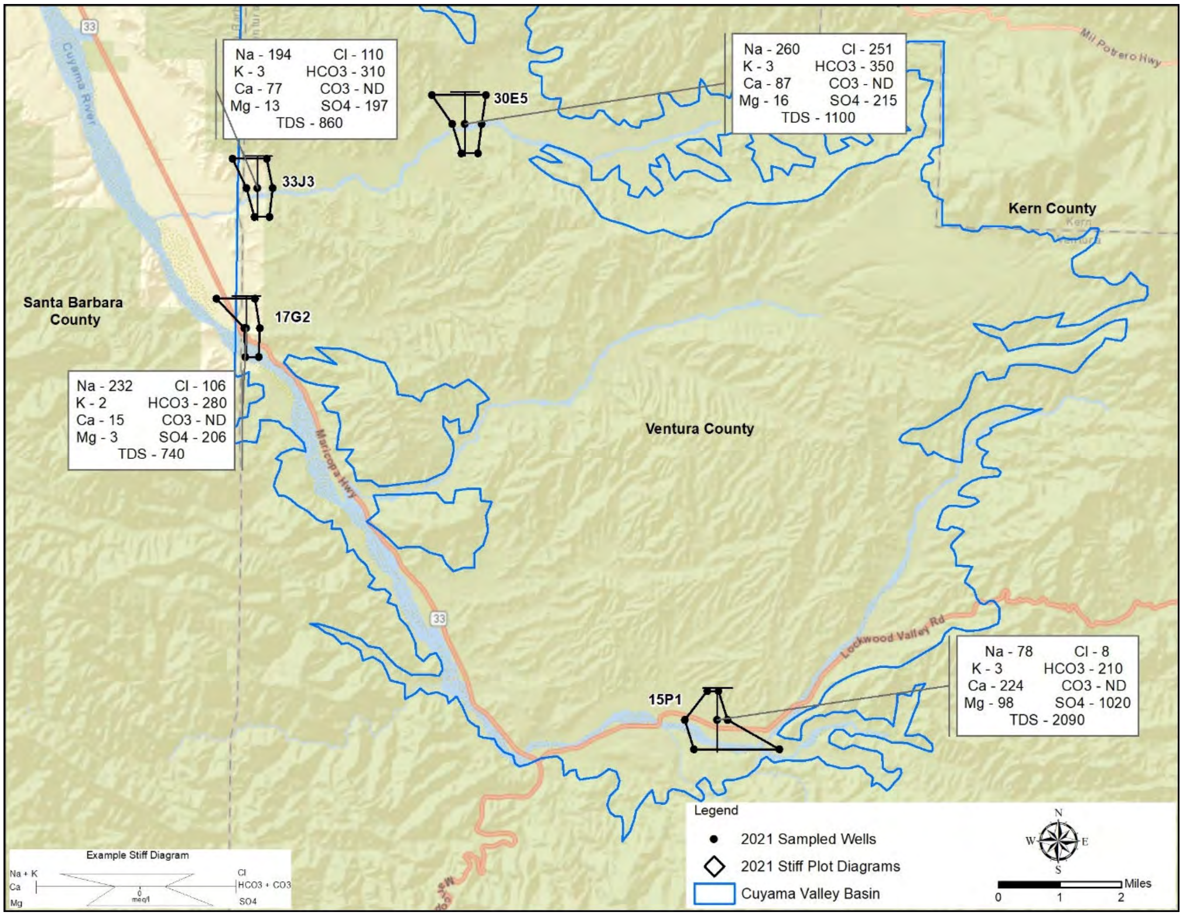


Figure 5-7: Cuyama Valley Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Santa Clara River Valley Basin – Fillmore Subbasin (DWR Basin No. 4-004.05)

The Fillmore Subbasin, though small in geographic area, has a total aquifer thickness of almost 8,000 feet in some locations. Despite the depth of the subbasin, County records indicate that water wells are generally no deeper than 950 feet. Water quality can vary greatly depending on the depth of a well. Shallow groundwater is generally younger and recharged by river flows. Deeper groundwater is older and has acquired its aqueous chemistry through dissolution of constituents from the surrounding lithology. There are approximately 611 water supply wells in the Fillmore Subbasin, of which 447 are active. Historically, nitrate concentrations have been elevated, but only three of the nine wells sampled this year showed elevated nitrate concentration relative to the primary MCL (**Table 5-7**). The Piper diagram in **Figure E-5** shows moderate variability in water quality of wells sampled in 2021. The dominant cation in all samples is calcium. Bicarbonate is the dominant anion in one sample. Sulfate is the dominant anion for seven samples. One sample has no dominant anion but plots close to sulfate. One water sample is calcium bicarbonate type, and the remaining eight samples are calcium sulfate type.

TDS concentrations in water from all nine wells sampled this season ranged from 660 to 1,430 mg/L and all nine exceeded the secondary MCL. All nine water samples exceeded the sulfate secondary MCL. The water in three wells had nitrate concentrations greater than the MCL for drinking water. Samples from four wells were analyzed for Title 22 metals. All Title 22 metals concentrations were below the MCL for drinking water. Water quality tends to degrade in the southeastern portion of the subbasin in the vicinity of the Oak Ridge fault. **Figure 5-8** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate. Water samples from all wells sampled in the Fillmore, Santa Paula and Piru subbasins were compared in a Piper diagram in **Figure E-14**. The Piper diagram shows moderate variability and the data from the three subbasins show little variation.

Table 5-7: Selected water quality results for the Fillmore Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
31H04	9/9/2021	16.9	**660**	220	19	-0.1
31P01	9/9/2021	**76.2**	**1100**	**332**	50	0.2
09D01	9/9/2021	**45.9**	**1430**	**575**	85	0.8
01P08	9/8/2021	**52.6**	**1080**	**369**	58	0.3
31F01	9/8/2021	12.7	**970**	**367**	75	0.6
19N01	9/8/2021	2.6	**1220**	**509**	42	0.5
36P04	9/9/2021	15.8	**980**	**378**	63	0.6
01F05	9/9/2021	30.8	**1130**	**455**	69	0.5
26D03	9/9/2021	44.7	**820**	**285**	51	0.3

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

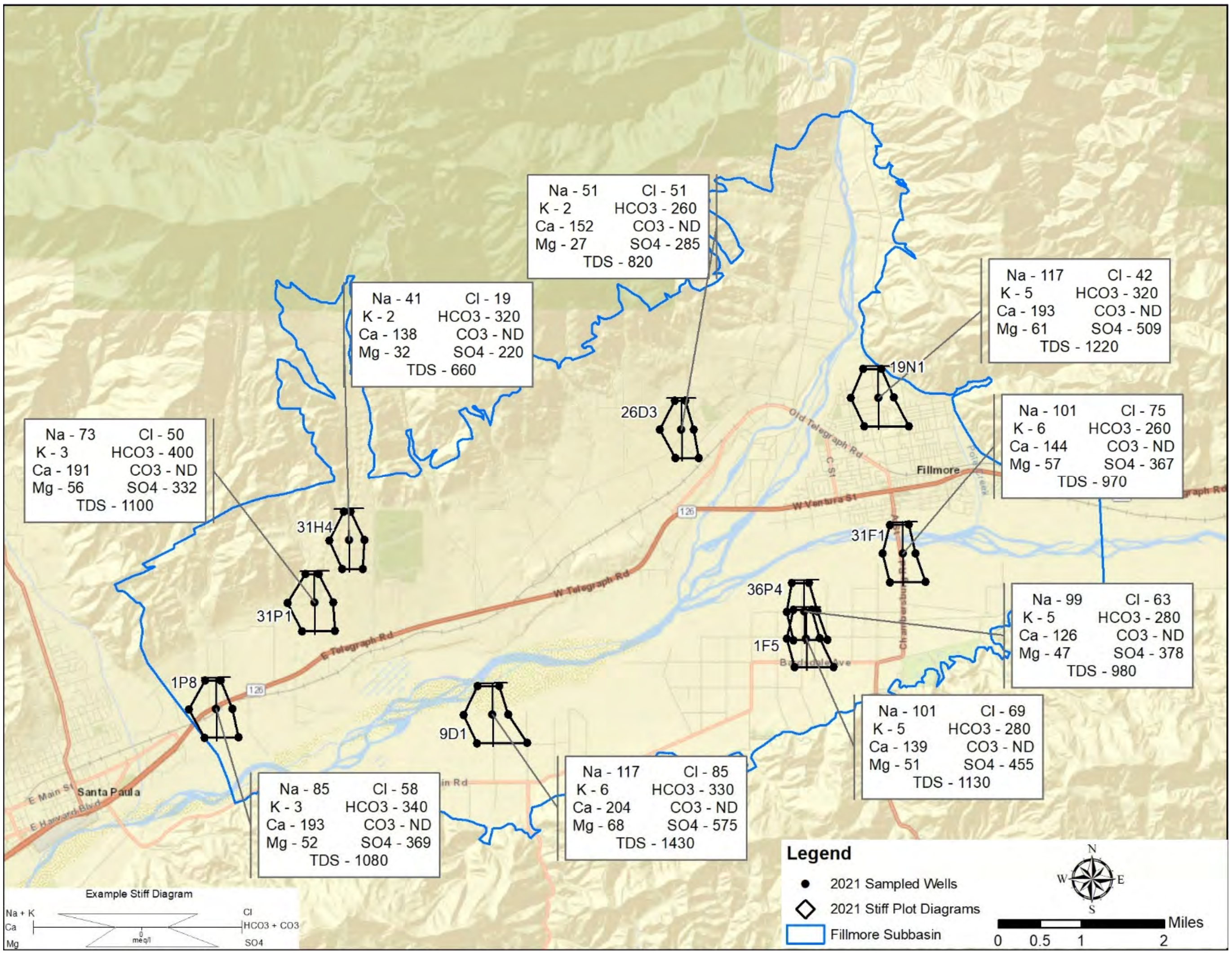


Figure 5-8: Fillmore Subbasin wells sampled with Stiff diagrams and selected inorganic constituents.

Las Posas Valley Basin (DWR Basin No. 4-008)

In previous annual reports the Las Posas Valley area was divided into three basins (east, west and south) using boundaries delineated by the County of Ventura. The California DWR Bulletin 118 basin boundaries designate one basin boundary for the whole valley. The geology of the basin causes differences in water levels and water quality between the east and the west areas of the basin. Because of this and other sustainable management factors, two management areas have been defined in the GSP for the Fox Canyon Groundwater Management Agency (FCGMA). The West Las Posas Management Area (WLPMA) encompasses what was formerly the West Las Posas Basin area and the East Las Posas Management Area (ELPMA) encompasses the area that was formerly the East Las Posas Basin and the South Las Posas Basin. The management area boundaries are defined in the GSP for the FCGMA.

Las Posas Valley Basin – East Las Posas Management Area

Water-bearing units of the ELPMA consist of Quaternary and Pleistocene alluvial deposits of varying thickness. Water-bearing deposits consist primarily of sand, or a mixture of sand and gravel identified as the Fox Canyon Aquifer and is the basal member of the San Pedro Formation (Stokes, 1971). The Fox Canyon Aquifer is generally considered to be confined in the ELPMA. Data indicates the Fox Canyon Aquifer receives recharge from leakage from overlying aquifers (FCGMA 2007 Basin Management Plan) and the exact hydrogeologic continuity is not well understood. The Somis fault acts as a hydrogeologic boundary between the ELPMA and WLPMA. Depth to the upper water-bearing unit is approximately 120 to 150 feet bgs and 530 to 580 feet bgs to the lower water-bearing unit. There are approximately 402 water supply wells in the ELPMA, of which 164 are active wells.

The Piper diagram in **Figure E-6** shows moderate variability in water quality between 25 wells sampled in 2021. Calcium is the dominant cation in fourteen samples and there are no dominant cations in the other samples, but they plot closest to the sodium cation. Sulfate is the dominant anion in sixteen samples, and bicarbonate is the dominant anion in nine. The water in eight wells is calcium bicarbonate type, calcium sulfate in ten wells, sodium bicarbonate in one well, and sodium sulfate in six wells. Chloride concentrations in eleven water samples were above the level that may cause impairment of agricultural beneficial uses for sensitive plants. The two southwestern wells had the highest chloride concentrations. None of the wells had chloride concentrations that exceed the primary MCL for drinking water. The remainder had good water quality with TDS ranging between 320 and 1,550 mg/L (**Table 5-8**).

The Piper diagram in **Figure E-21** shows a comparison between the ELPMA and WLPMA water chemistry. There is moderate variability in the water quality of the combined areas. Water samples from both management areas are in two main groups: those with sulfate as the dominant anion and plot as calcium sulfate type, and those with no dominant anion but plot near the bicarbonate type and calcium bicarbonate type. The water chemistry of both management areas is similar, although based on the sharp change in water level between the ELPMA and WLPMA, the degree of hydrogeologic connection appears to be limited.

TDS was above the secondary MCL in eighteen wells, ranging from 320 to 1,550 mg/L (**Table 5-8**). Water from three wells had nitrate concentrations above the primary MCL. Thirteen samples had sulfate concentrations above the secondary MCL. Water from thirteen wells was analyzed for Title 22 metals and all constituents were below the MCLs. **Figure 5-9** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-8: Selected water quality results for the Las Posas Valley Basin – East Las Posas Management Area.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
9Q5	10/21/2021	11.6	**1550**	**565**	164	0.7
4R3	10/21/2021	ND	**1360**	**511**	139	0.4
8H2	10/21/2021	20.5	**1170**	**403**	133	0.6
28J4	10/20/2021	**64**	**630**	120	54	ND
34G1	10/20/2021	ND	440	131	11	ND
26R3	10/20/2021	0.5	**540**	194	12	ND
30E6	10/20/2021	5.2	330	69.2	13	ND
29K6	10/20/2021	**73.5**	450	37.2	42	ND
29K8	10/20/2021	17.3	**510**	124	28	ND
10G1	10/22/2021	**56.5**	**1470**	**507**	158	0.7
7D2	10/22/2021	18.2	**1160**	**395**	149	0.6
7B2	10/22/2021	6.8	**1240**	**459**	148	0.8
1Q2	10/22/2021	13.9	**1400**	**512**	154	0.8
1Q1	10/22/2021	28	**1210**	**354**	126	0.7
16B6	10/22/2021	2.6	**1330**	**513**	165	0.6
26H1	11/17/2021	34.2	**530**	105	61	0.1
03H1	11/17/2021	ND	**860**	**278**	78	0.2
31B1	11/17/2021	ND	430	142	26	0.1
4F1	11/18/2021	ND	**1080**	**344**	92	0.1
4B1	11/18/2021	ND	450	148	14	0.1
36P1	11/19/2021	19	320	56	20	0.1
28N3	11/22/2021	ND	**1070**	**310**	121	0.9
1B2	11/22/2021	ND	**540**	177	88	0.2
6F1	11/22/2021	16.3	**1090**	**345**	127	0.6
10D2	11/22/2021	35.9	470	98.1	54	ND

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

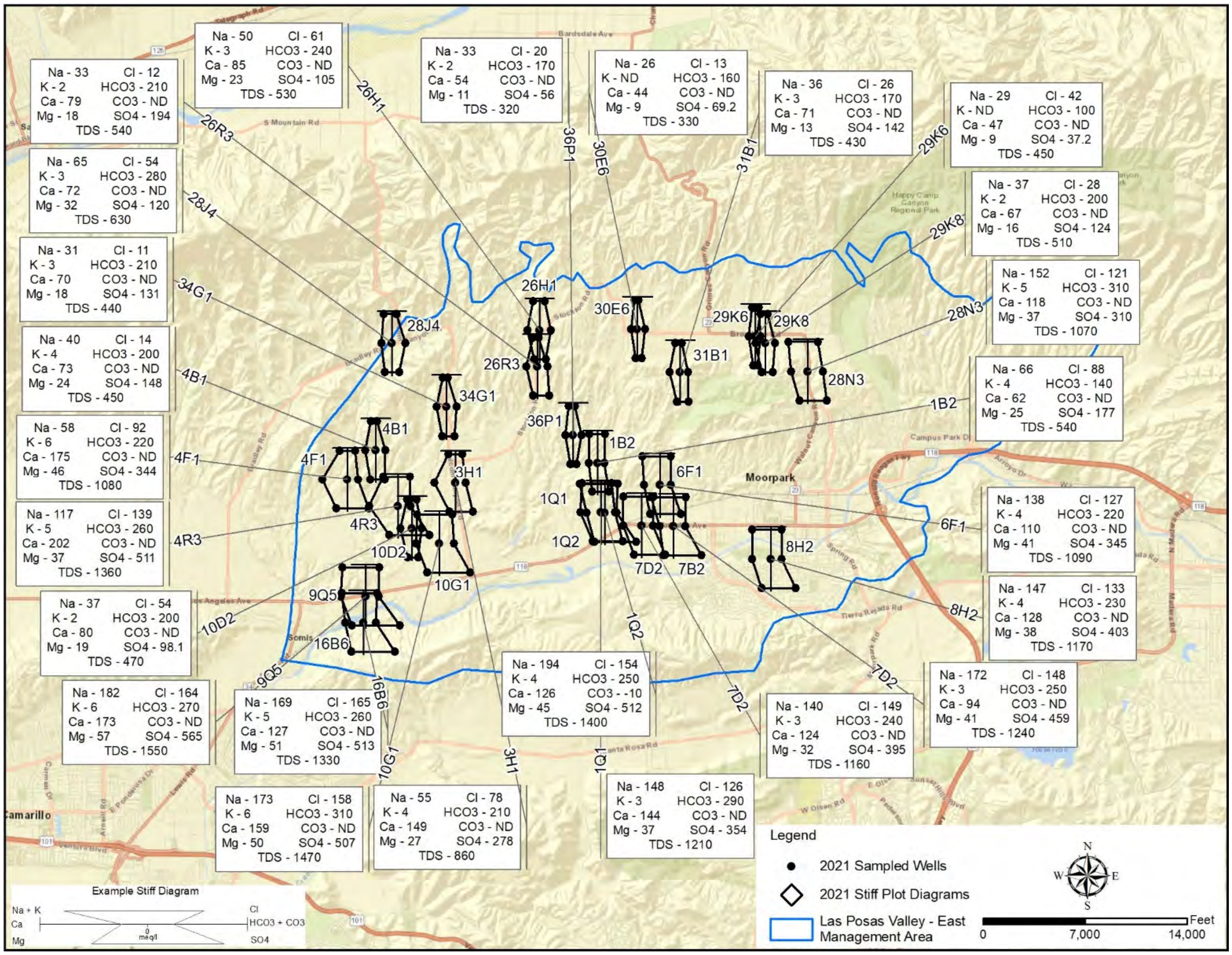


Figure 5-9: Las Posas Valley Basin EMA, sampled wells with Stiff diagrams and selected inorganic constituents.

Las Posas Valley Basin – West Las Posas Management Area

There are approximately 164 water supply wells in the WLPMA of the Las Posas Valley Basin, of which 89 are active. Twenty-two wells within the WLPMA were sampled in 2021. The Piper diagram in **Figure E-7** shows moderate variability in water quality. Calcium is the dominant cation in three samples, sodium is the dominant cation in three samples and there is no dominant cation in the remaining samples. Bicarbonate is the dominant anion in five samples, and sulfate is the dominant anion in eight samples. There is no dominant anion in the remaining samples. The water in seven wells is calcium bicarbonate type, one is sodium bicarbonate type, five are sodium sulfate type, and nine are calcium sulfate type.

TDS was above the secondary MCL in nineteen wells, ranging from 330 to 1,730 mg/L (**Table 5-9**). Water from four wells had nitrate concentrations above the primary MCL. Thirteen samples had sulfate concentrations at or above the secondary MCL. Water from twelve wells was analyzed for Title 22 metals. Selenium concentration was above the MCL for drinking water in two samples. All other constituents were below the MCLs. **Figure 5-10** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-9: Selected water quality results for the Las Posas Basin - West Las Posas Management Area.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
17L01	10/4/2021	25.8	**1370**	**511**	156	0.6
15M04	10/21/2021	8.9	**1050**	**385**	85	0.3
09N01	10/21/2021	2.4	**900**	**298**	66	0.4
18H01	10/21/2021	**117**	**1730**	**605**	131	0.4
18H14	10/21/2021	ND	**930**	**348**	49	0.3
08F01	10/21/2021	ND	330	95.4	13	ND
17N03	10/20/2021	14.9	**820**	**257**	70	0.4
10G03	10/20/2021	2.7	**640**	154	50	0.3
11A02	10/20/2021	**162**	**1480**	**411**	112	0.2
11A03	10/20/2021	ND	**620**	197	33	ND
36Q01	10/20/2021	**73**	**770**	164	88	ND
12H02	10/20/2021	8.8	**550**	143	51	ND
13A01	10/22/2021	ND	490	165	15	0.1
17F05	11/9/2021	ND	**950**	**361**	64	0.6
35P02	11/9/2021	**67.3**	**780**	217	85	0.2
32K01	11/9/2021	ND	**1040**	**395**	25	0.3

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
07R03	11/9/2021	ND	370	115	20	ND
06R01	11/17/2021	ND	**540**	200	16	0.2
28A02	11/17/2021	ND	**820**	**253**	67	0.4
10Q04	11/19/2021	ND	**790**	250	35	0.2
16J03	12/1/2021	ND	**690**	**251**	53	0.3
20A02	12/1/2021	0.2	**890**	**382**	45	0.7

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

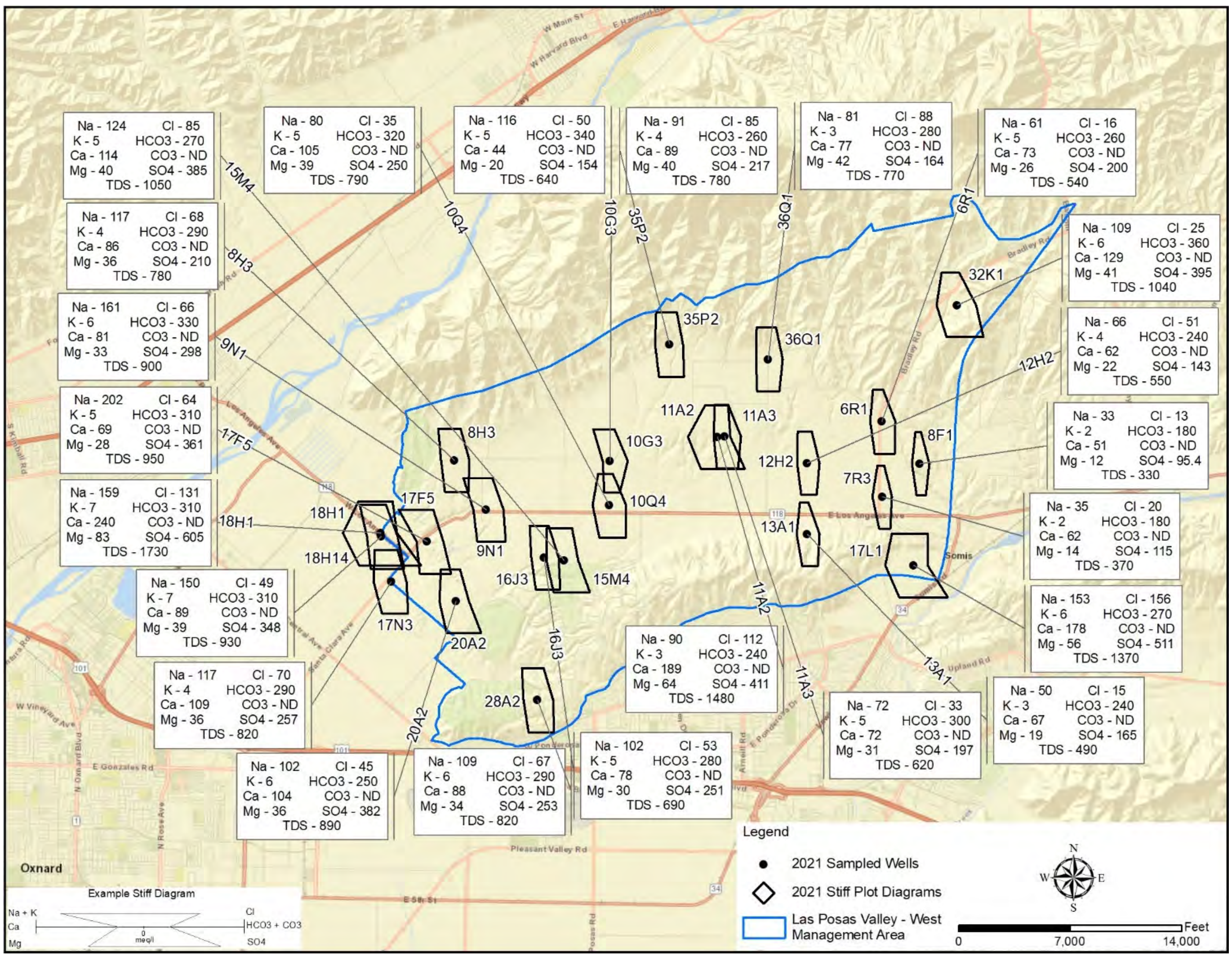


Figure 5-10: Las Posas Valley Basin WLPMA sampled wells with Stiff diagrams and selected inorganic constituents.

Lockwood Valley Basin (DWR Basin No. 4-017)

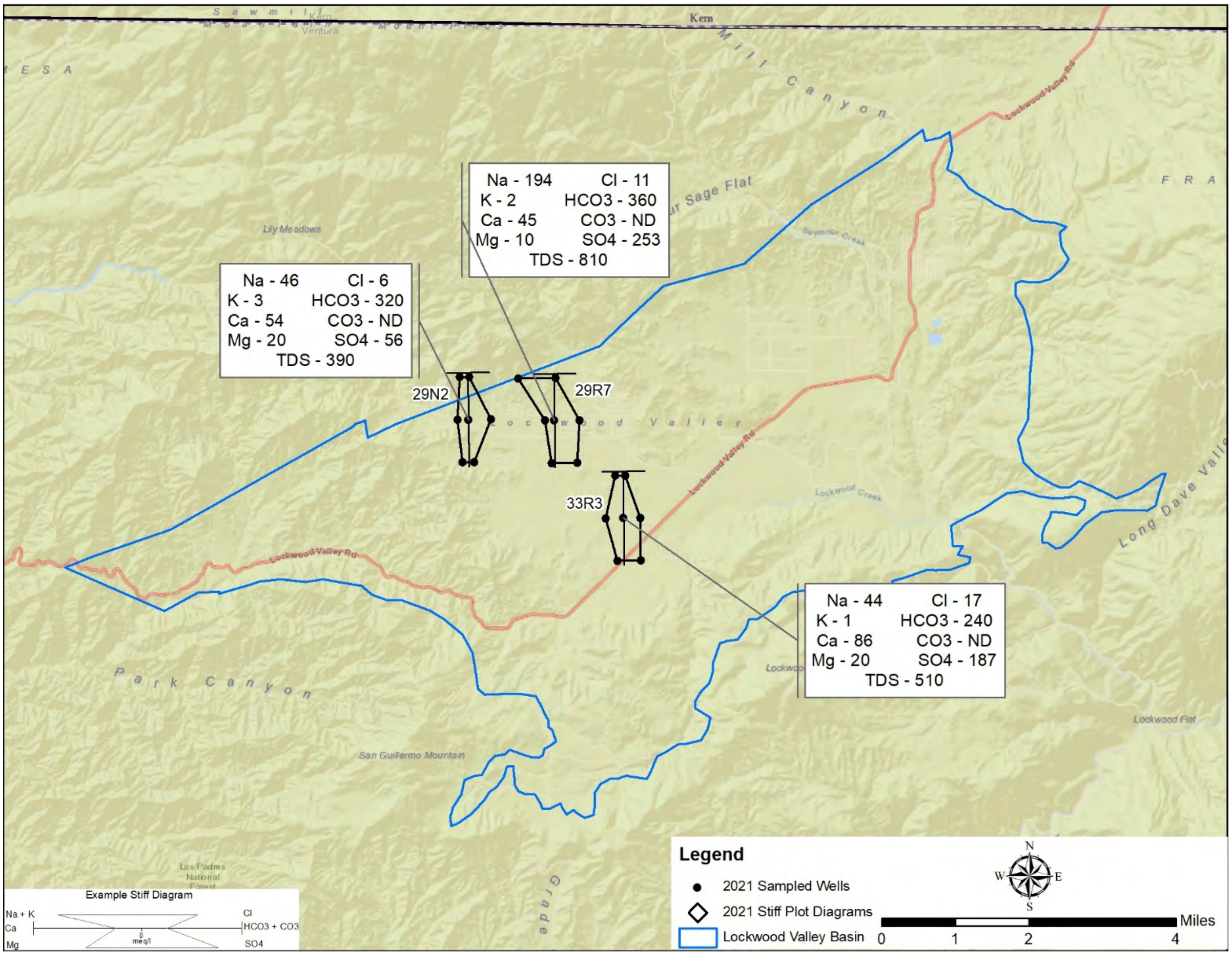
The Lockwood Valley Basin groundwater quality ranges from good to poor. The Basin covers a geographic area of 34.1-square miles. Water-bearing units consist of Quaternary alluvium, Tertiary sedimentary rocks and Quaternary stream channel alluvium. The Tertiary sedimentary rocks have high silt and clay content, resulting in low permeability. The alluvial material consists primarily of silty and clayey sands, gravels and boulders and has a much higher permeability than the underlying Tertiary sedimentary rocks. The Quaternary stream channel alluvium, prevalent near existing stream channels, contain a smaller percentage of clays and silts and wells penetrating this material tend to be higher yielding producers. Depth to water-bearing units range from 55 to 60 feet. There are approximately 291 water supply wells in the Lockwood Valley Basin, of which 248 are active. Three wells were sampled in the basin in 2021. The Piper diagram in **Figure E-25** shows sodium is the dominant cation in one sample and calcium is the dominant cation in two samples. Bicarbonate is the dominant anion in all three samples. One sample is sodium bicarbonate type and two are calcium bicarbonate type.

Two samples had TDS concentrations and one sample had a sulfate concentration above the secondary MCL (**Table 5-10**). **Figure 5-11** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-10: Selected water quality results for the Lockwood Valley Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
33R3	11/12/2021	6.9	**510**	187	17	0.8
29R7	11/12/2021	2	**810**	**253**	11	13.4
29N2	11/12/2021	ND	390	56	6	0.3

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL



<u>Figure 5-11:</u> Lockwood Valley Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Santa Clara Valley River – Mound Subbasin (DWR Basin No. 4-004.03)

The water-bearing units of the Mound Subbasin consist of Quaternary alluvium and the San Pedro Formation. These formations are divided into the Upper Aquifer System (UAS) and the Lower Aquifer System (LAS). The UAS consists of undifferentiated Holocene alluvium that make up the Oxnard Aquifer and older Pleistocene alluvium that makes up the Mugu Aquifer. The alluvium consists of silts and clays with lenses of sand and gravel, with a maximum thickness of 500 feet. The LAS predominantly consists of fine sands and gravels of the San Pedro Formation and extends as deep as 4,000 feet bgs. The upper part of the San Pedro formation consists of variable amounts of clay, silty clay and sand. A series of inter-bedded water-bearing sands in this unit are time equivalent to the Hueneme Aquifer of the Oxnard Subbasin. The lower part of the San Pedro Formation consists primarily of sand and gravel zones with layers of clay and silt and is equivalent to the Fox Canyon aquifer found in the Oxnard plain. Groundwater is generally unconfined in the alluvium and confined in the San Pedro Formation. Historic water quality data for the basin shows that water quality is generally better in the lower zone.

There are 86 water supply wells in the Mound Subbasin, of which 32 are active. Four wells were sampled in the basin in 2021. The Piper diagram in **Figure E-26** shows low variability in water quality of all the wells sampled this year. There is no dominant cation for any of the water samples. Sulfate is the dominant anion for all samples. Three samples are calcium sulfate, and one is sodium sulfate type. Two water samples were analyzed for Title 22 metals. All Title 22 constituents were below the MCL for drinking water.

All samples had TDS and sulfate concentrations above the secondary MCL (**Table 45-11**). **Figure 5-12** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-11: Selected water quality results for the Mound Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
13K3	9/14/2021	ND	**1140**	**410**	75	0.6
9K7	9/14/2021	0.7	**1230**	**496**	77	0.5
13F2	9/14/2021	ND	**1130**	**387**	68	0.6
10N4	9/14/2021	10.3	**1020**	**413**	48	0.4

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

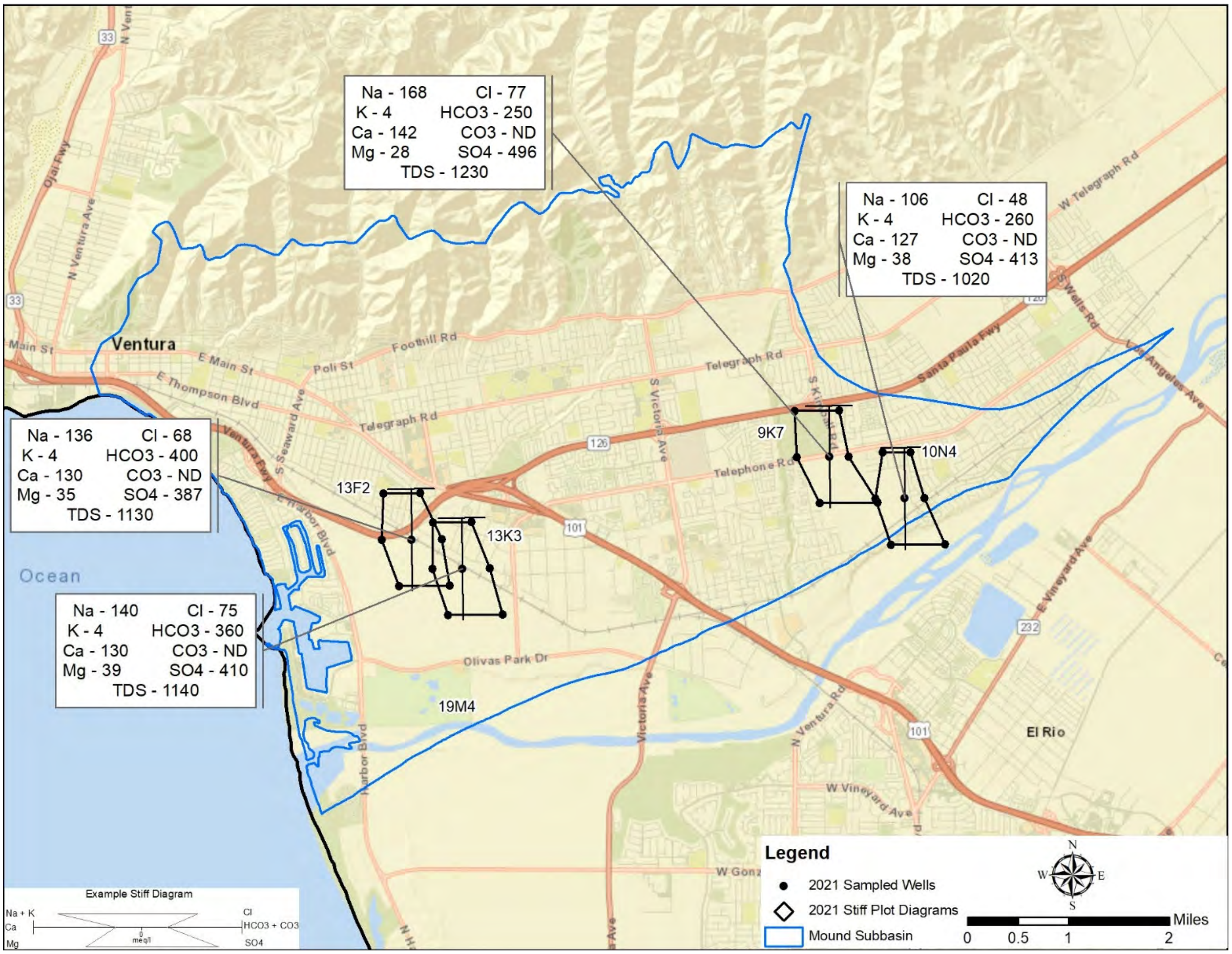


Figure 5-12: Mound Subbasin sampled wells with Stiff diagrams and selected inorganic constituents.

Ojai Valley Basin (DWR Basin No. 4-002)

The aquifer system of Ojai Valley Basin is considered unconfined except in the western end of the basin where a semi-confining to confining clay layer is present. Water quality in the basin is considered good. There are approximately 327 water supply wells in the basin, of which 191 are active. Depth to water-bearing units is generally 25 to 30 feet bgs. Piper diagram **Figure E-8** shows low variation of the water quality for eleven wells sampled in 2021. Calcium is the dominant cation in six samples; sodium is the dominant cation in one sample; and the remaining samples have no dominant cation. Sulfate is the dominant anion in one sample, bicarbonate in two samples, chloride is the dominant anion in one sample and there is no dominant anion in the remaining samples. The water in one well is calcium chloride, one is sodium bicarbonate, four are calcium sulfate, and five are calcium bicarbonate type.

Water from all eleven wells had TDS concentrations above the secondary MCL (**Table 5-12**). TDS concentrations ranged from 560 to 1,220 mg/L. The Sulfate concentration in two wells exceeded the secondary MCL. One well had a nitrate concentration above the MCL for drinking water. Water samples from four wells were analyzed for Title 22 metals. None of the constituents were above the primary MCL. **Figure 5-12** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate for wells sampled in the Ojai Valley Basin.

Table 5-12: Selected water quality results for the Ojai Valley Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
04P05	11/10/2021	31.7	**680**	226	28	ND
04Q01	11/10/2021	**52.9**	**680**	213	25	ND
05H04	11/10/2021	18.5	**630**	218	19	ND
05M04	11/10/2021	36.9	**740**	232	25	ND
06J09	11/10/2021	31.8	**670**	218	33	ND
06K14	11/10/2021	21.8	**910**	210	138	0.6
01J03	11/10/2021	ND	**560**	179	24	ND
01K02	11/10/2021	ND	**600**	194	29	ND
12B03	11/10/2021	ND	**1220**	152	**318**	ND
32K02	11/10/2021	5.1	**840**	**299**	49	ND
33J01	11/10/2021	ND	**1120**	**436**	56	ND

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

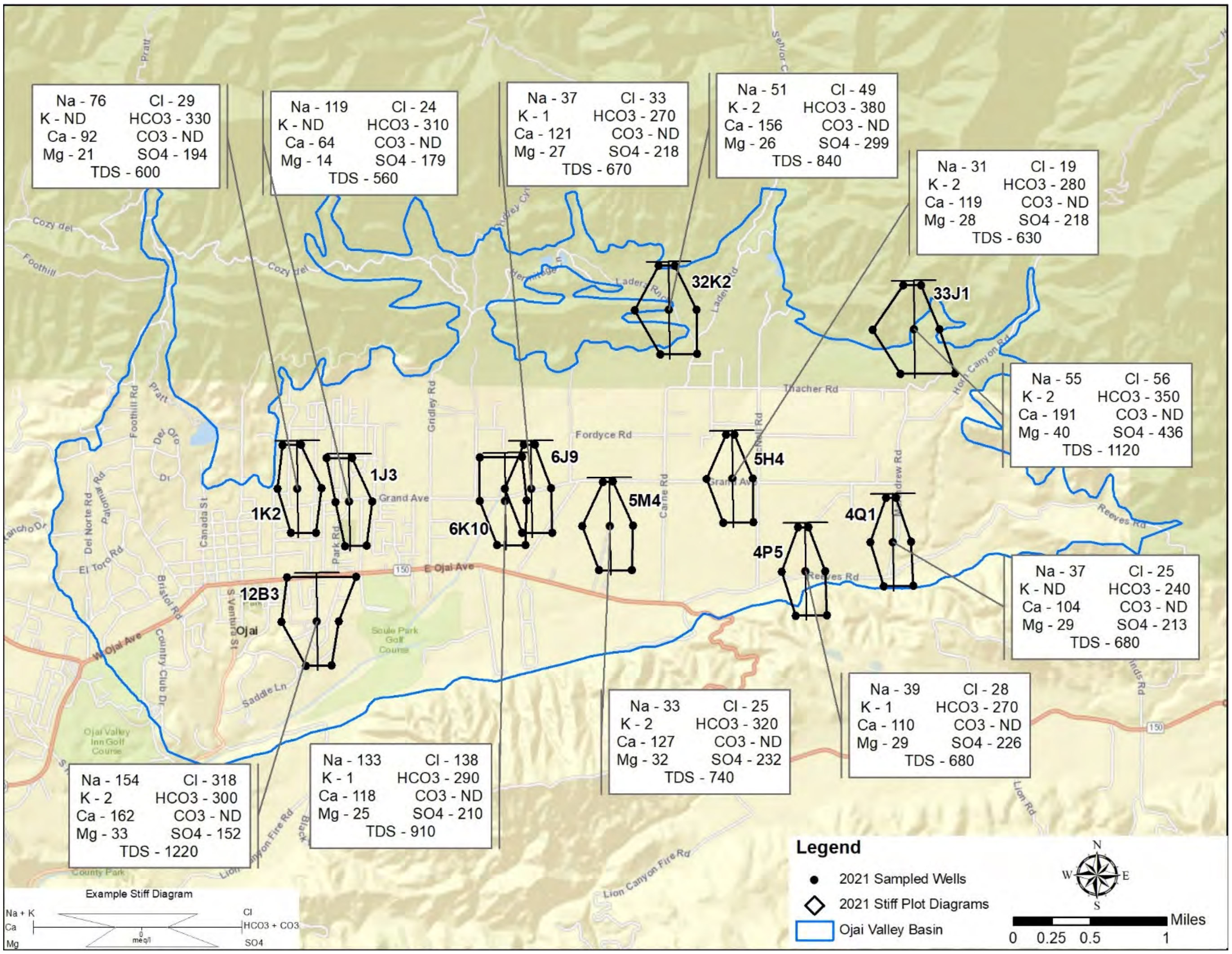


Figure 5-13: Ojai Valley Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Santa Clara River Valley Basin – Oxnard Subbasin (DWR Basin No. 4-004.02)

Previous annual reports divided the Oxnard Subbasin into two separate basins. The Oxnard Plain Forebay and the Oxnard Plain Pressure Basin. DWR Bulletin 118 groundwater basin boundaries are used in this annual report and the Forebay is included within the boundary of the Oxnard Subbasin. Because of the difference in UAS geology between the Oxnard Plain Forebay and the Oxnard Plain Pressure Basin, the Forebay is separated as a management area within the Oxnard Subbasin. The Oxnard Subbasin is the largest and most complex of the groundwater basins in Ventura County and consists of two major aquifer systems, the UAS and the LAS. There are approximately 1,182 water supply wells in the Oxnard Subbasin, of which 464 are active.

From shallowest to deepest, the UAS consists of the Perched/Semi Perched, Oxnard and Mugu aquifers. Only the Oxnard and Mugu Aquifers are sampled in the UAS. The LAS consists, from shallowest to deepest, of the Hueneme, Fox Canyon and Grimes Canyon aquifers. There are no wells perforated solely in the Grimes Canyon aquifer, therefore it cannot be sampled exclusively.

Forebay Management Area

The Forebay Management Area is the principal recharge area for the UAS and LAS of the Oxnard Subbasin. Depth to water-bearing units is generally 25 to 50 feet. There are approximately 281 water supply wells in the Forebay Management Area, of which 102 are active wells. The Forebay Management Area generally has acceptable water quality except in the southern area where high nitrate concentrations are common. The northern area is predominantly agricultural with a few residential areas that still rely on individual septic systems. One well was sampled in 2021 from the LAS. The Piper diagram in **Figure E-28** shows the water quality of the well sampled this year. There is little difference from previous years. There is no dominant cation and sulfate is the dominate anion. The water in the sample is calcium sulfate type. The water sample was analyzed for Title 22 metals and no constituents were above the primary MCL.

The sample had TDS and sulfate concentrations above the secondary MCL (**Table 5-12**). **Figure 5-14** shows approximate well location and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-13: Selected water quality results for the Oxnard Subbasin Forebay Management Area.

Well No.	Date Sampled	Aquifer	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
7P4	10/21/2021	Hueneme / Fox Canyon / Grimes	ND	**1240**	**516**	68	0.5

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

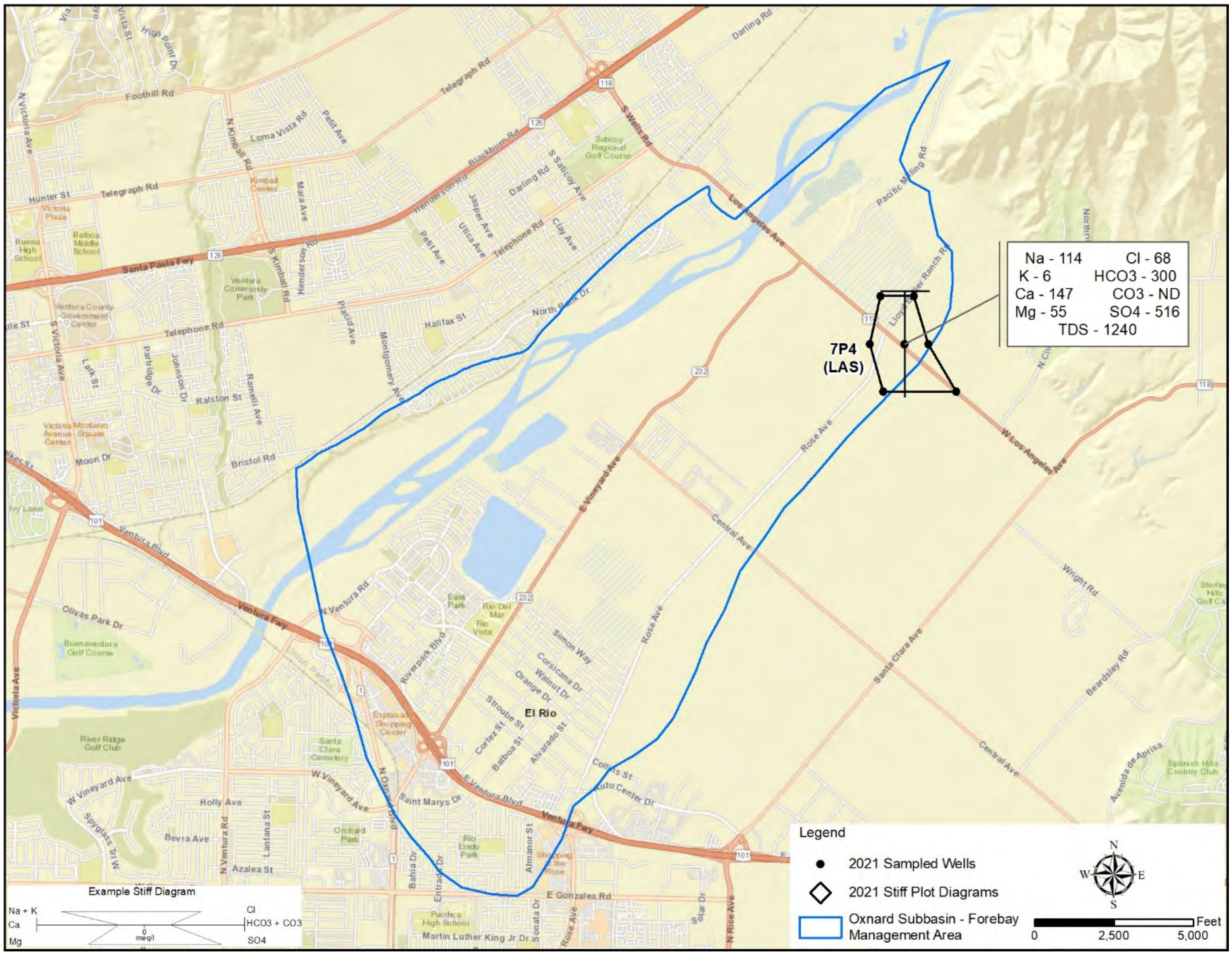


Figure 5-14: Oxnard Subbasin Forebay Management Area sampled wells with Stiff diagrams and selected inorganic constituents.

Upper Aquifer System (UAS) – Outside Forebay Management Area

Oxnard Aquifer

The Oxnard Aquifer is the shallowest of the confined aquifers and the most developed, based on the number of wells. Average depth to the main water-bearing unit is 80 feet bgs.

Four wells were sampled from the Oxnard Aquifer in 2021. Water from two wells had manganese concentrations above the secondary MCL. Water samples from all four wells had TDS and sulfate concentrations above the secondary MCL. Sulfate concentrations ranged from 393 to 654 mg/L. TDS concentrations range from 1,050 to 1,550 mg/L. None of the samples were analyzed for Title 22 metals.

Table 5-14: Selected water quality results for wells screened in the Oxnard Aquifer.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
31B1	11/5/2021	Oxnard	Upper	23.8	**1060**	**393**	55	0.8
32C4	11/5/2021	Oxnard	Upper	36.9	**1110**	**408**	59	0.8
25M1	11/15/2021	Oxnard	Upper	1.4	**1050**	**424**	54	0.6
6B1	11/15/2021	Oxnard	Upper	5.2	**1550**	**654**	80	1

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

Groundwater plumes with elevated nitrate concentrations are common in the northern portion of the Basin. Sources of nitrate include nitrogen-based fertilizers in agricultural areas and septic systems in residential areas.

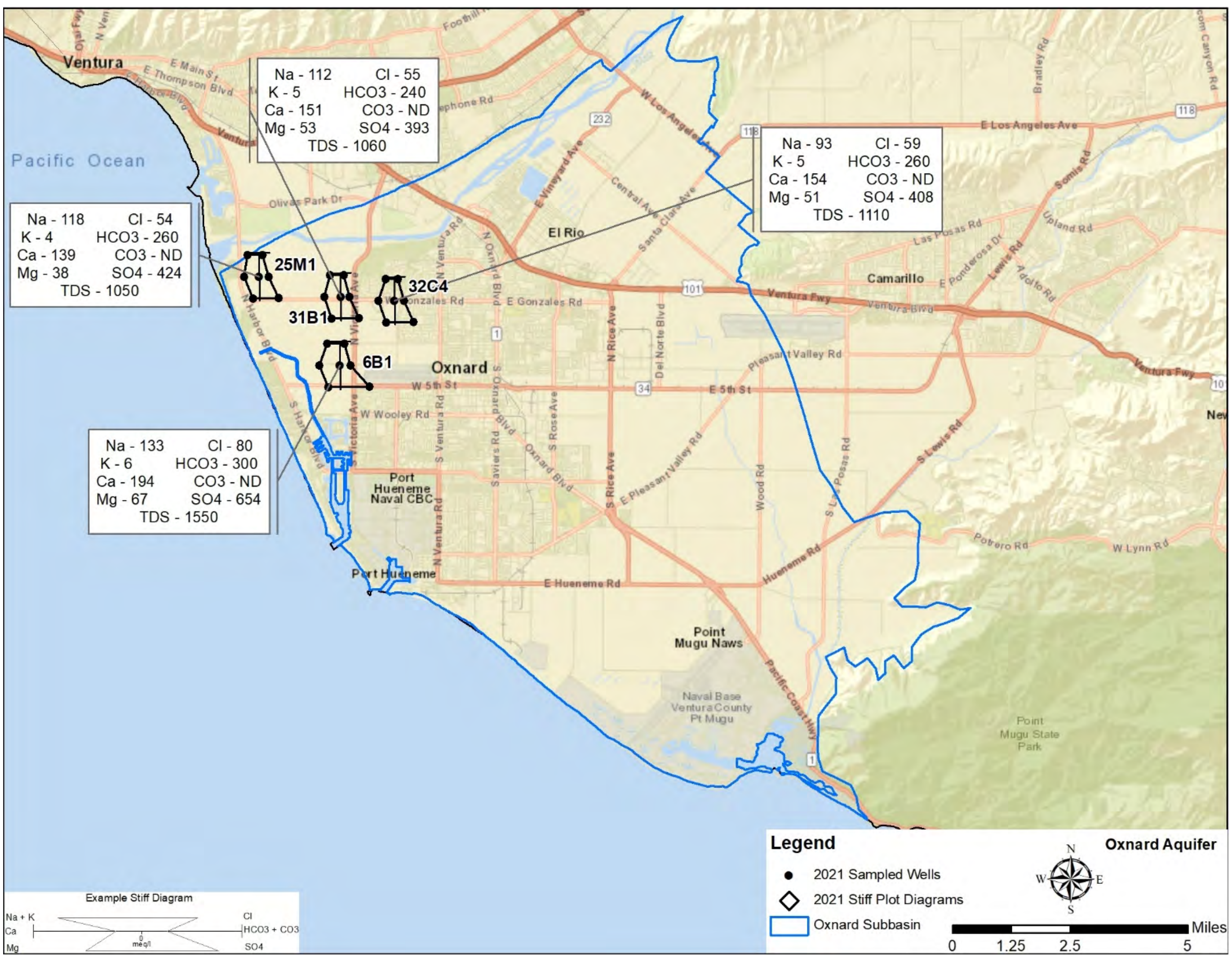


Figure 5-15: Oxnard Subbasin Oxnard Aquifer sampled wells with Stiff diagrams and selected inorganic constituents.

Mugu Aquifer

The Mugu Aquifer is the lowest layer of the UAS and has similar physical and chemical characteristics to the Oxnard Aquifer, with slightly better water quality. Average depth to the main water-bearing unit is 200 feet bgs. Three wells perforated solely in the Mugu Aquifer were sampled in 2021. The water from all wells had sulfate and TDS concentrations above the primary MCL. No wells were analyzed for Title 22 metals.

Table 5-15: Selected water quality results for wells screened in the Mugu Aquifer.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
6R2	11/5/2021	Mugu	Upper	4.1	**1410**	**570**	73	0.9
24M3	12/1/2021	Mugu	Upper	2.8	**1280**	**381**	240	0.6
24C3	12/1/2021	Mugu	Upper	ND	**880**	**388**	42	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

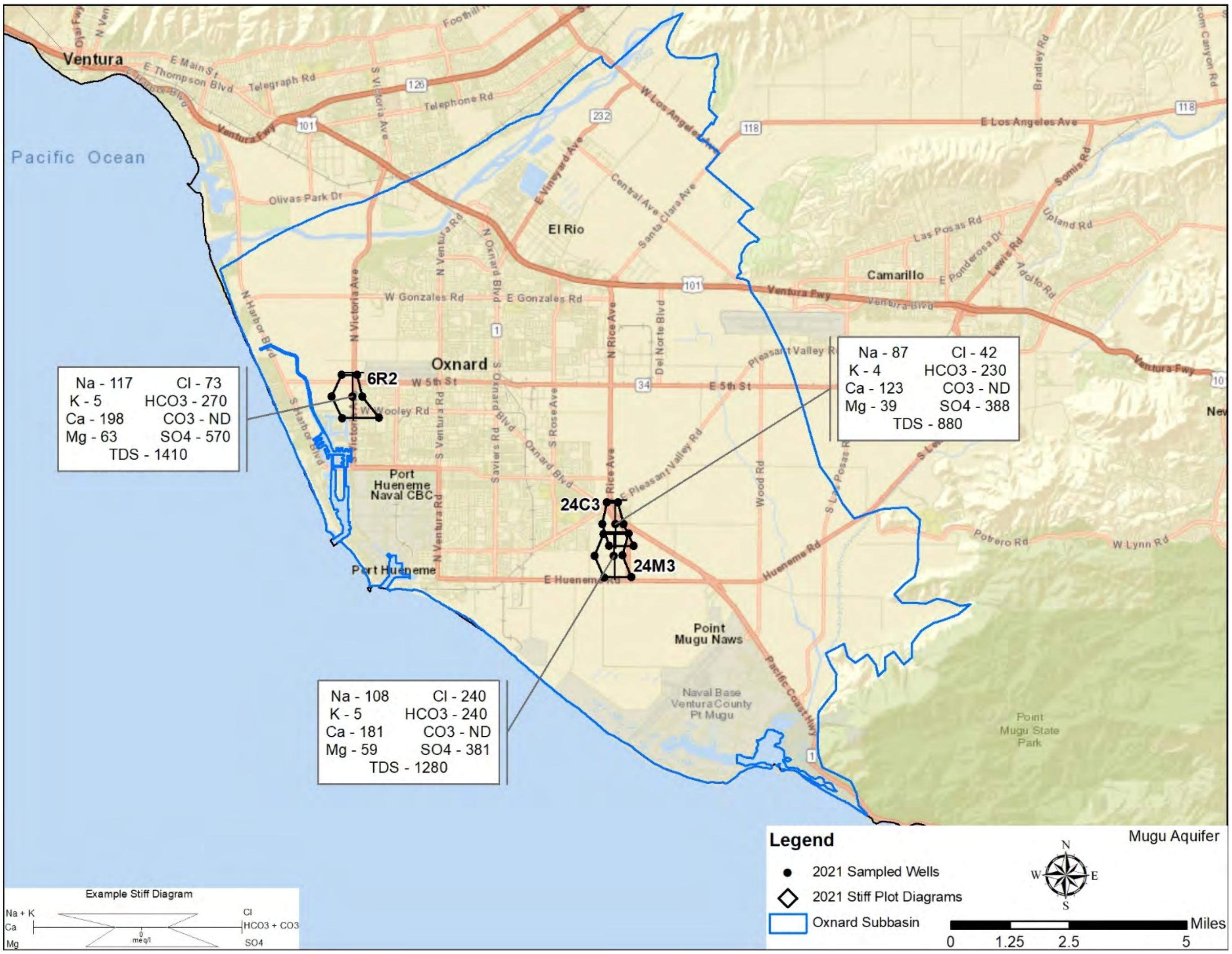


Figure 5-16: Oxnard Subbasin Mugu Aquifer sampled wells with Stiff diagrams and selected inorganic constituents.

Oxnard & Mugu Aquifers

Six Oxnard Subbasin wells were sampled in 2021 perforated across both the Oxnard and Mugu Aquifers and will be referred to as UAS wells. Results for those wells are included in **Appendix D** and shown on the map of the UAS (**Figure 5-17**). All six samples had TDS and sulfate concentrations above the secondary MCL. TDS concentrations varied between 1,020 and 5,130 mg/L. One sample had chloride concentrations above the MCL. Water samples from one Oxnard/Mugu well was analyzed for Title 22 metals and all constituents were below the primary MCL.

Table 5-16: Selected water quality results for wells screened across the Oxnard & Mugu Aquifers.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)

31D2	11/5/2021	Oxnard & Mugu	Upper	13.8	**1040**	**446**	51	0.8
19P1	11/15/2021	Oxnard & Mugu	Upper	23	**1490**	**630**	85	0.6
7H5	11/15/2021	Oxnard & Mugu	Upper	ND	**1200**	**433**	99	0.7
12Q3	11/16/2021	Oxnard & Mugu	Upper	ND	**1020**	**385**	52	0.7
29B3	12/1/2021	Oxnard & Mugu	Upper	0.2	**1040**	**322**	108	0.5
25K1	12/1/2021	Oxnard & Mugu	Upper	1.4	**5130**	**466**	**1230**	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

The Piper diagram in **Figure E-9** shows a comparison of all wells sampled in the UAS and perforated in the Oxnard, Mugu or across both aquifers. There is no dominant cation, though the data plots closest to a calcium cation type. One sample has chloride as the dominant anion, two samples have no dominant anion, and the dominant anion for the remaining samples is sulfate. One UAS sample is calcium chloride type, and the remaining samples are calcium sulfate type.

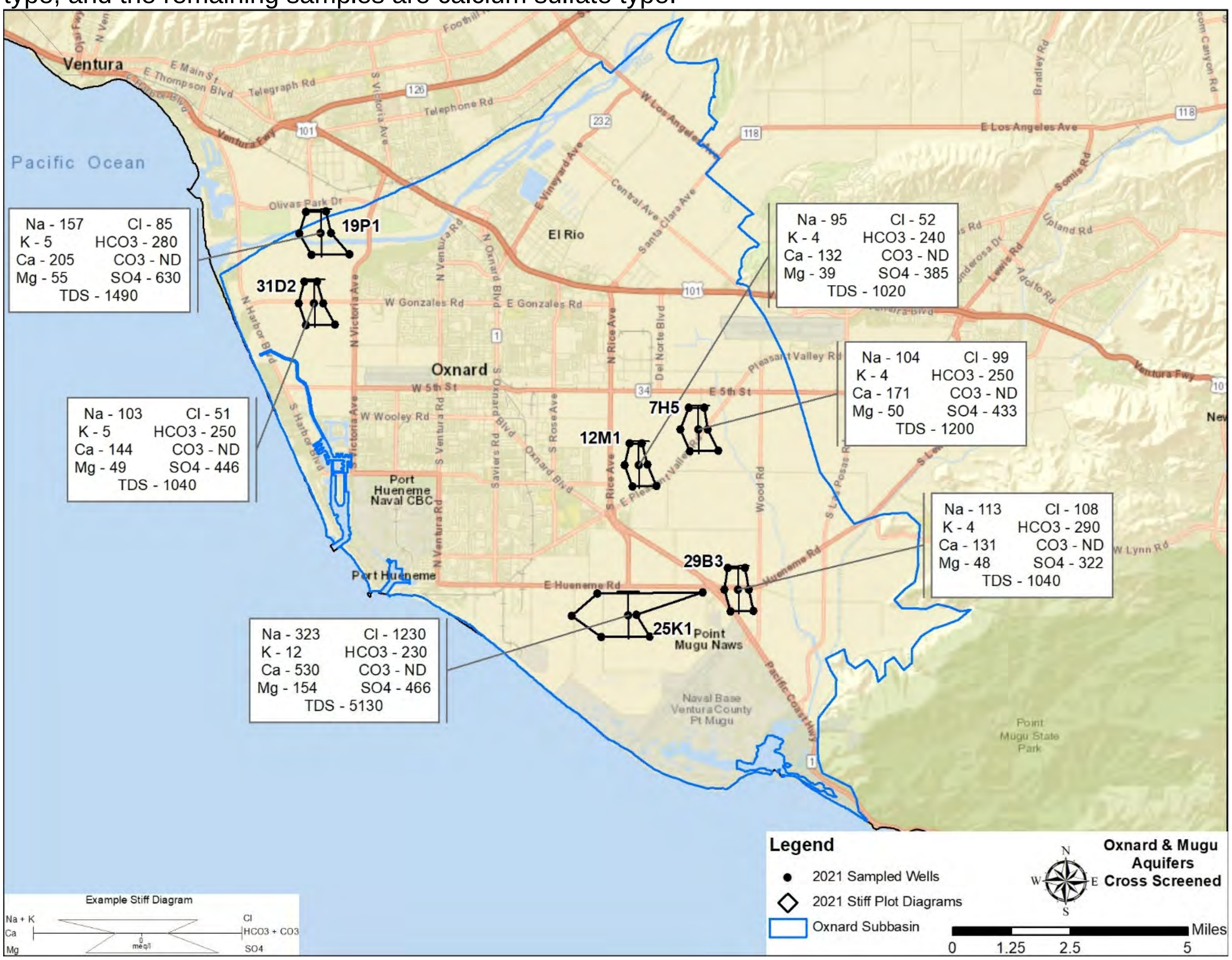


Figure 5-17: Oxnard Subbasin Oxnard & Mugu Aquifers cross screened sampled wells with Stiff diagrams and selected inorganic constituents.

Lower Aquifer System (LAS)

Hueneme Aquifer

The Hueneme Aquifer is the shallowest of the LAS aquifers with the depth to the main water-bearing unit at approximately 375 feet. Few wells are perforated exclusively in the Hueneme Aquifer making water quality determination for the aquifer difficult. One well screened solely in the Hueneme Aquifer was sampled in 2021 (**Figure 5-18**). The well had TDS and sulfate concentrations above the secondary MCL. The sample was analyzed for Title 22 metals and no constituents were above the MCL.

Table 5-17: Selected water quality results for wells screened in the Hueneme Aquifer.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
30F3	11/5/2021	Hueneme	Lower	ND	**920**	**408**	47	0.7

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

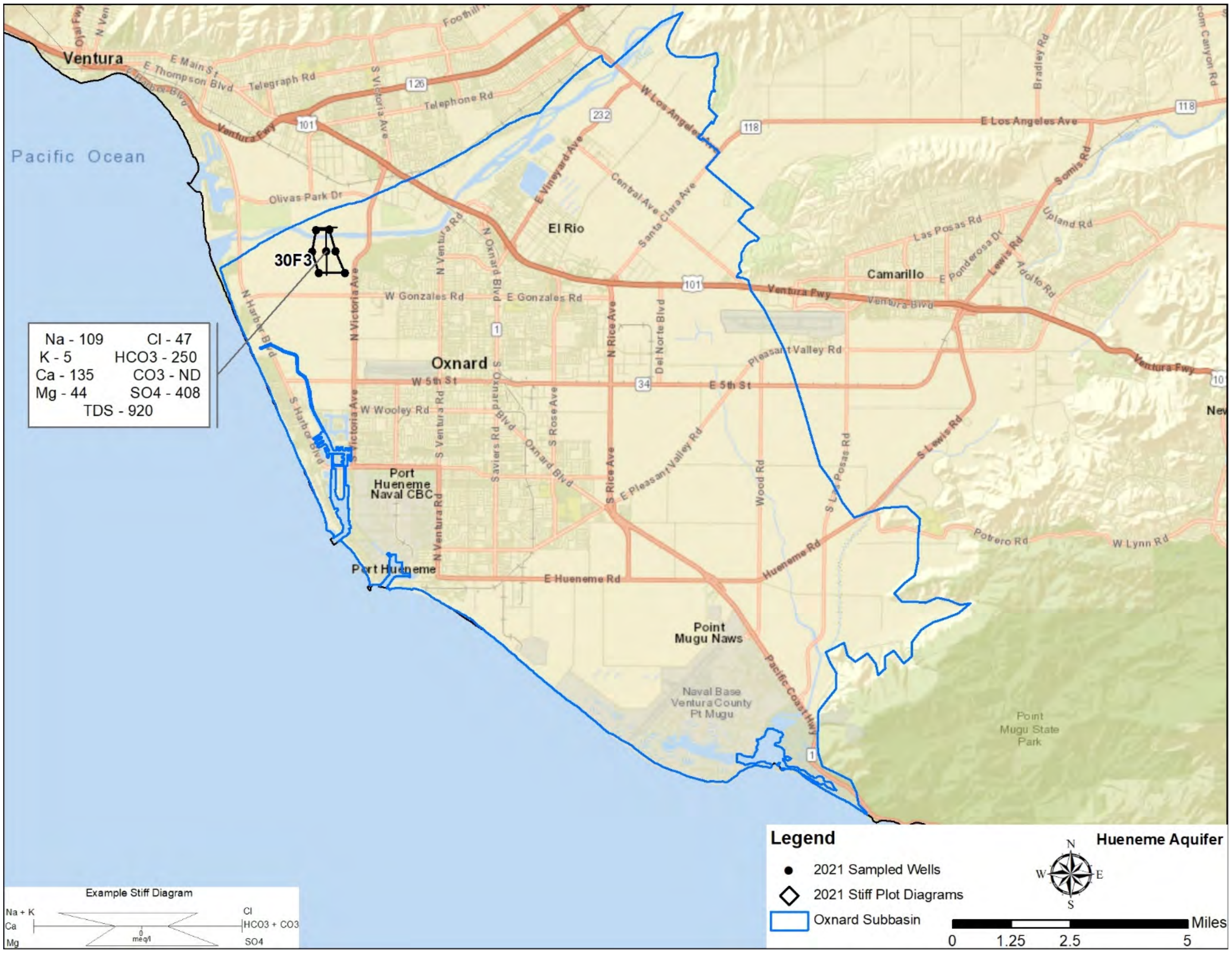


Figure 5-18 Oxnard Subbasin Hueneme Aquifer sampled wells with Stiff diagrams and selected inorganic constituents.

Fox Canyon Aquifer

The Fox Canyon Aquifer is the second most-developed production zone in the Oxnard Subbasin, based on the number of wells and depth of perforations. Eight wells perforated solely in the Fox Canyon Aquifer were sampled in 2021 (**Figure 5-19**). Depth to the main water-bearing unit is approximately 580 feet bgs. The Fox Canyon Aquifer generally has excellent water quality and high yield rates but is subject to seawater intrusion near Point Mugu and the Hueneme Submarine Canyon. Extractions are monitored and allocated by the FCGMA to help mitigate aquifer overdraft and reduce the intrusion of seawater.

All eight samples had TDS concentrations that exceeded the secondary MCL. Seven samples had sulfate concentrations that exceeded the secondary MCL. One sample was analyzed for Title 22 metals and no constituents were above the MCL.

Table 5-18: Selected water quality results for wells screened in the Fox Canyon Aquifer.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
20Q5	10/20/2021	Fox Canyon	Lower	ND	**970**	**341**	73	0.6

36B2	11/15/2021	Fox Canyon	Lower	ND	**850**	222	114	0.6
20B1	11/15/2021	Fox Canyon	Lower	ND	**790**	**257**	46	0.6
25K2	12/1/2021	Fox Canyon	Lower	ND	**800**	**265**	38	0.6
26K3	12/1/2021	Fox Canyon	Lower	0.2	**830**	**292**	43	0.4
26M3	12/1/2021	Fox Canyon	Lower	0.3	**870**	**297**	43	0.4
26P2	12/1/2021	Fox Canyon	Lower	0.2	**780**	**254**	40	0.4
23R2	12/1/2021	Fox Canyon	Lower	0.2	**890**	**310**	43	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

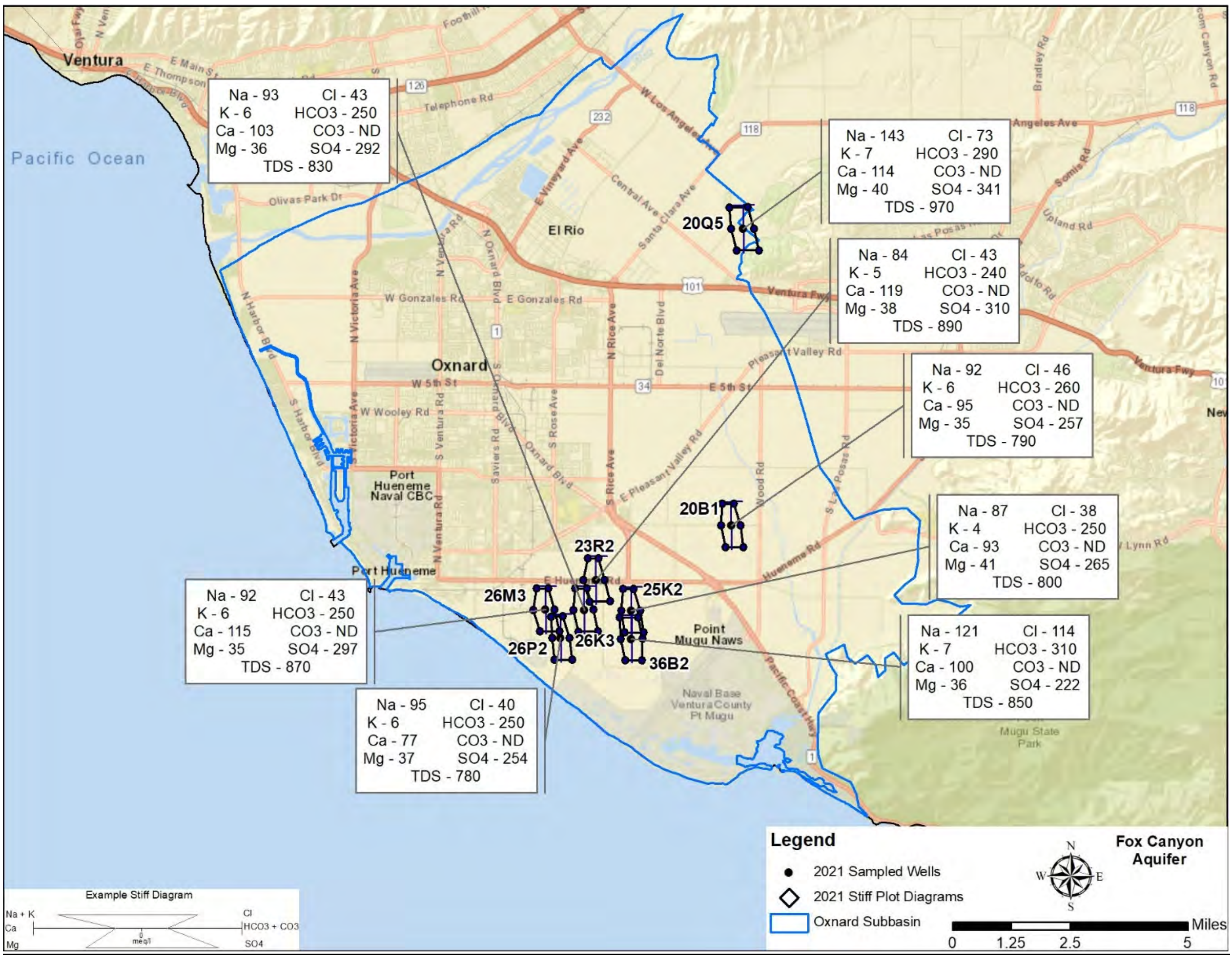


Figure 5-19 Oxnard Subbasin Fox Canyon Aquifer sampled wells with Stiff diagrams and selected inorganic constituents.

Hueneme & Fox Canyon Aquifers

Five Oxnard Subbasin wells were sampled in 2021 perforated across both the Hueneme and Fox Canyon Aquifers and will be referred to as LAS wells. Results for those wells are included in **Appendix D** and shown on the map of the LAS (**Figure 5-20**). All five samples had TDS concentrations and four had sulfate concentrations above the secondary MCL. TDS concentrations varied between 780 and 1,050 mg/L. Water samples from two Hueneme/Fox Canyon wells were analyzed for Title 22 metals and all constituents were below the primary MCL.

Table 5-19: Selected water quality results for wells screened across the Hueneme & Fox Canyon Aquifers.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
24P2	10/20/2021	Hue & Fox	Lower	9.6	**980**	**411**	50	0.6
30A2	10/20/2021	Hue & Fox	Lower	3.6	**920**	**346**	55	0.5
19J3	11/15/2021	Hue & Fox	Lower	ND	**1050**	**421**	53	0.7
17B2	11/15/2021	Hue & Fox	Lower	ND	**780**	**265**	44	0.5
21H2	11/18/2021	Hue & Fox	Lower	ND	**820**	217	100	0.5

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

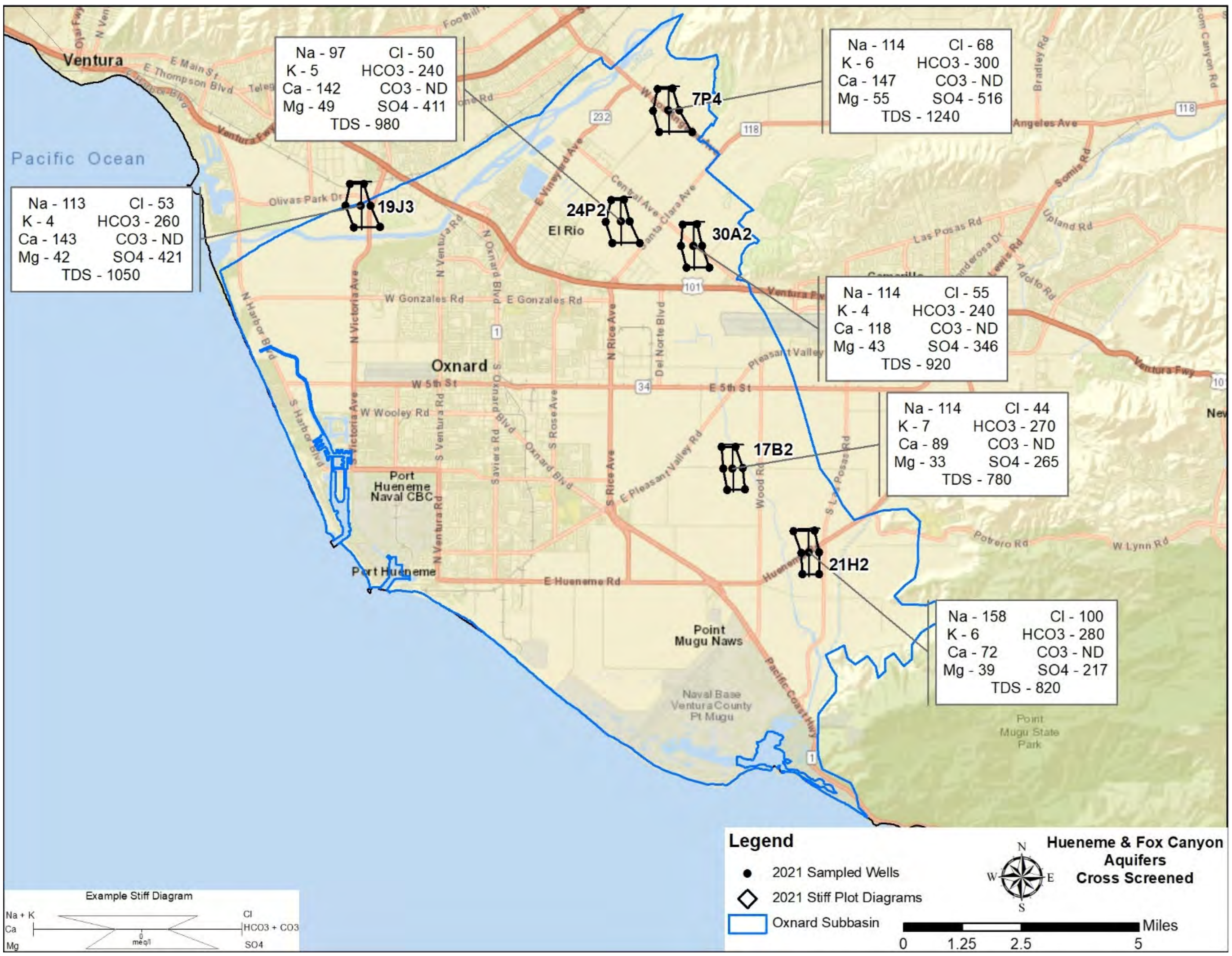


Figure 5-20 Oxnard Subbasin Hueneme and Fox Canyon Aquifers cross screened sampled wells with Stiff diagrams and selected inorganic constituents.

Hueneme, Fox Canyon & Grimes Canyon Aquifers

Three Oxnard Subbasin wells sampled in 2021 are perforated across the Hueneme, Fox Canyon and Grimes Canyon Aquifers. They are also referred to as LAS wells. Results for those wells are included in **Appendix D** and shown on the map of the LAS in **Figure 5-22**. All three samples had TDS concentrations above the secondary MCL. TDS concentrations from these wells varied between 610 and 790 mg/L. Water samples from one Fox/Hueneme/Grimes well was analyzed for Title 22 metals with all constituents below the primary MCL.

Table 5-20: Selected water quality results for wells screened across the Hueneme, Fox Canyon & Grimes Aquifers.

Well No.	Date Sampled	Aquifer	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
22C1	11/18/2021	Hue, Fox & Grimes	Lower	ND	**610**	170	65	0.3
8R1	11/18/2021	Hue, Fox & Grimes	Lower	ND	**750**	201	68	0.4
4D4	11/18/2021	Hue, Fox & Grimes	Lower	ND	**790**	178	107	0.5

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

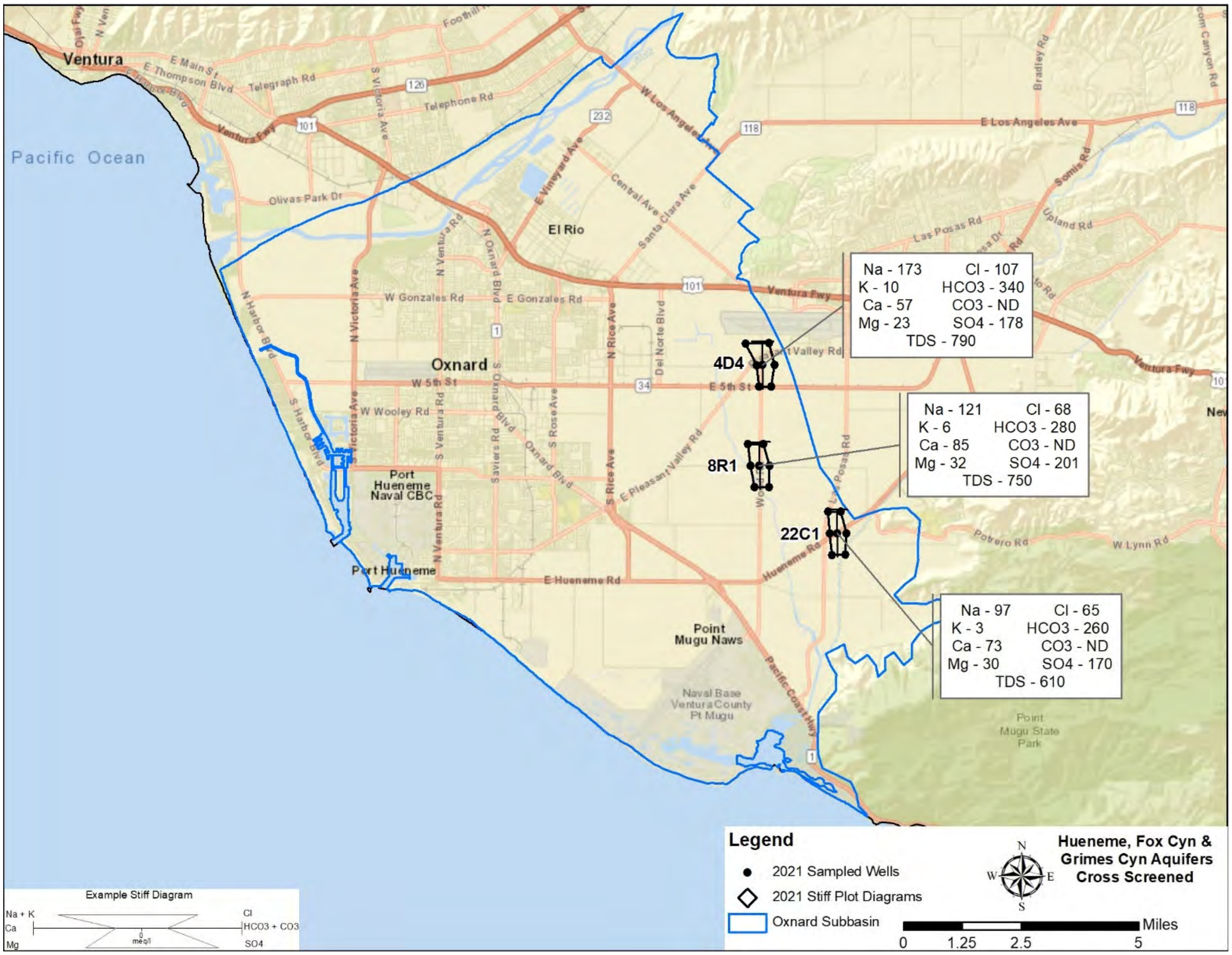


Figure 5-21 Oxnard Subbasin Hueneme, Fox Canyon and Grimes Canyon Aquifers cross screened sampled wells with Stiff diagrams and selected inorganic constituents.

The Piper diagram **Figure E-10** shows moderate variability in water quality of all wells sampled in the LAS. Sodium is the dominant cation in three samples, and the remainder have no dominant cation but about half plot closely to the sodium type and half plot closely to the calcium type. Five samples have no dominant anion but plot close to the bicarbonate ion and sulfate is the dominant anion for the remainder. Three water samples are sodium sulfate type, five samples are sodium bicarbonate, and the remainder are calcium sulfate type.

The Piper diagram **Figure E-11** shows moderate variation between all wells sampled in the Oxnard Subbasin.

Santa Clara River Valley Basin – Piru Subbasin (DWR Basin No. 4-004.06)

The Piru Subbasin groundwater recharge is principally from precipitation, water releases from Lake Piru by UWCD, and the Santa Clara River. Flow from the Santa Clara River enters the basin from the east and carries discharges from wastewater treatment plants and urban and stormwater runoff from Los Angeles County. There are approximately 191 water supply wells in the Piru Subbasin, of which 150 are active. Depth to the main water-bearing unit is approximately 30 to 90 feet. On April 6, 2010, the LARWQCB adopted a Basin Plan Amendment that includes a Total Maximum Daily Load (TMDL) of 117 mg/L for chloride in surface water and 150 mg/L in groundwater for the stretch of the Santa Clara River in Ventura County east of Piru Creek.

Six wells were sampled in the Piru Subbasin in 2021. None of the groundwater sampled had a chloride concentration above the TMDL. The Piper diagram, **Figure E-12** shows low variability in water quality. There is no dominant cation for any samples. Sulfate is the dominant anion for four samples with no dominant anion for the remaining samples. Five samples are calcium sulfate type, and one sample is sodium sulfate type. The TDS concentrations exceeded the secondary MCL in all samples and varied from 770 to 2,370 mg/L (**Table 5-22**). Sulfate concentrations exceeded the secondary MCL in five samples. One sample had nitrate concentration greater than the primary MCL. **Figure 5-23** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Water samples from two wells were analyzed for Title 22 metals. No constituents were above the Title 22 MCL's.

Table 5-21: Selected water quality results for the Piru Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
30J4	9/08/2021	10.5	**860**	**338**	57	0.6
25H1	9/08/2021	**81.2**	**1540**	**509**	142	0.7
25M3	9/08/2021	39.7	**2370**	**1080**	73	0.9
30J4	9/14/2021	16.6	**770**	233	66	0.5
26J3	9/14/2021	13.1	**960**	**327**	106	0.5
26H1	9/14/2021	24.2	**1230**	**419**	103	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

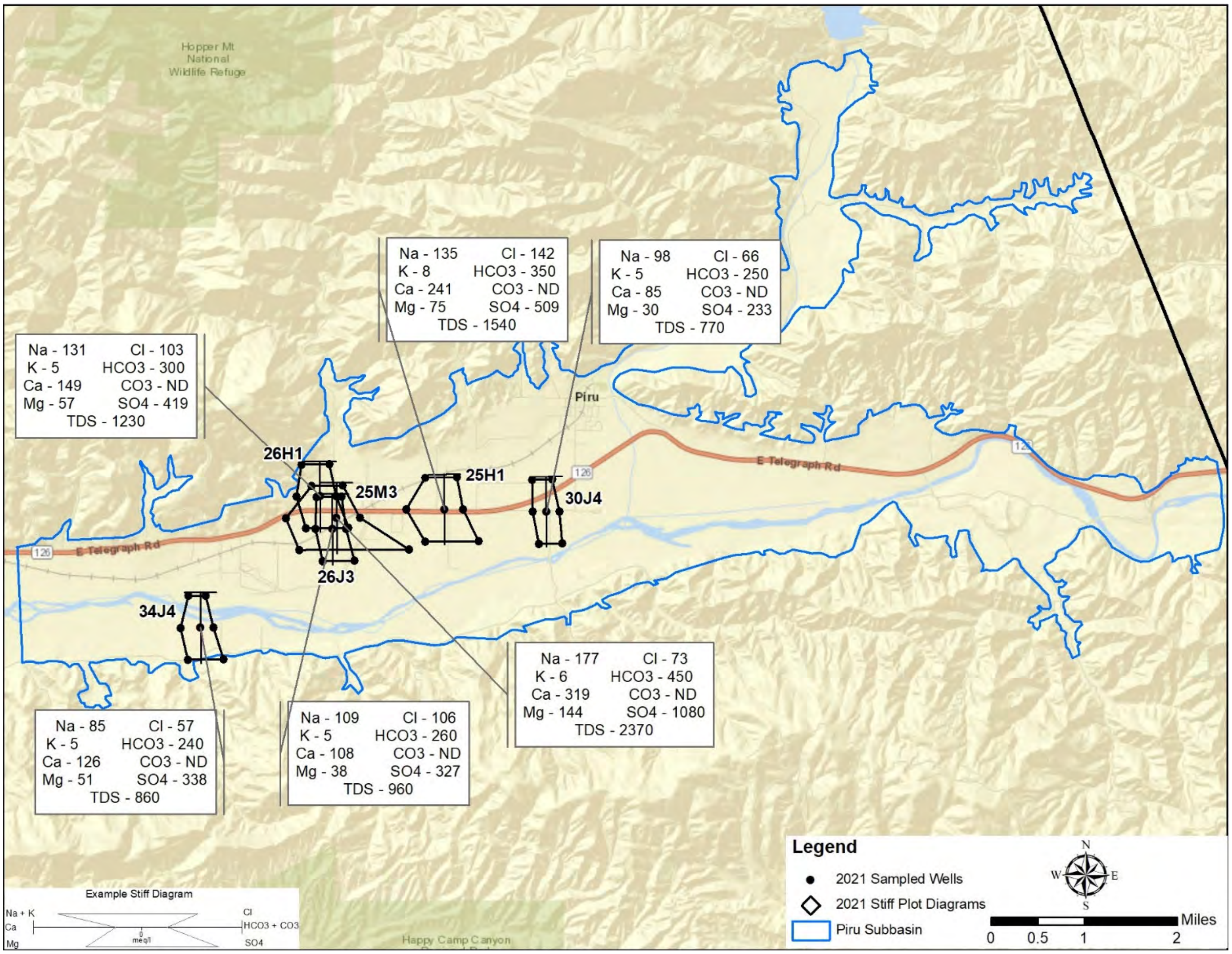


Figure 5-22: Piru Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Pleasant Valley Basin (DWR Basin No. 4-006)

Pleasant Valley Basin groundwater quality varies greatly throughout the basin. The upper-most water-bearing unit at 35 to 60 feet is not used due to very poor water quality. Permeable lenses of alluvial sands, gravels, silts and clays of recent to Upper Pleistocene age that vary in thickness from a few feet to several hundred feet are equivalent to but not connected with the Oxnard Aquifer and are referred to as the upper zone in this report. Depth to the main water-bearing unit is approximately 400 to 500 feet bgs. Underlying the upper zone are the aquifers of the Lower Aquifer System (LAS). First are the marine sands and gravels of the lower-most member of the early Pleistocene San Pedro Formation and is known as the Fox Canyon Aquifer. The Grimes Canyon Aquifer underlies the Fox Canyon Aquifer at depths below 1,000 feet and is perforated by only the deepest wells. There are approximately 347 water supply wells in the Pleasant Valley Basin, of which 85 are active. Eighteen wells were sampled in 2021, with four perforated in the upper zone, one perforated in both zones, and thirteen perforated in the LAS.

The Piper diagram, **Figure E-13** shows a comparison of wells perforated in the upper zone with those perforated in the LAS. Wells perforated in the upper zone tend to have higher concentrations of sulfate than those in the LAS but in general the upper and LAS show similar water quality. The Piper diagram shows more variability in the water samples from the LAS. For wells in the upper zone, calcium is the dominant cation in one sample and the remaining three samples have no dominant cation but plot closely to the calcium type. Three samples are calcium sulfate type, and one sample is sodium sulfate. For wells in the LAS, sodium is the dominant cation in one sample. The remainder have no dominant cation. Sulfate is the dominant anion in five samples with no dominant anion for the remainder. The water in three samples is sodium sulfate type, five samples are sodium bicarbonate type, and five samples are calcium sulfate type. The water in the well perforated in both zones is calcium sulfate type.

TDS concentrations in all water samples varied from 670 to 4,620 mg/L. All sixteen wells sampled had TDS concentrations above the secondary MCL, with the four highest concentrations in the upper zone. Nine wells had sulfate concentrations above the secondary MCL; the three highest were in the upper zone. Three wells had nitrate concentrations above the drinking water MCL; the highest in an upper zone well. Chloride concentrations were above the secondary MCL in three wells and twelve were above a concentration that can impair agricultural beneficial uses. Four water samples were analyzed for Title 22 metals. None of the analyses were above the primary MCL. **Figure 5-24** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-22: Selected water quality results for the Pleasant Valley Basin.

Well No.	Date Sampled	Aquifer System	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
2H4	11/16/2021	Both	**112**	**2200**	**717**	183	0.8
29B2	10/4/2021	Lower	5.7	**780**	157	122	0.2
1M2	11/16/2021	Lower	ND	**940**	204	149	0.3
1D8	11/16/2021	Lower	ND	**1120**	197	192	ND
4R2	11/16/2021	Lower	18.7	**820**	248	78	0.3
15D2	11/18/2021	Lower	5.2	**1400**	**474**	160	0.5
10G1	11/18/2021	Lower	1.2	**950**	226	147	0.6
3R1	11/18/2021	Lower	31.5	**1820**	**587**	191	0.7
4K1	11/18/2021	Lower	ND	**870**	238	96	0.4
34G1	11/18/2021	Lower	ND	**1180**	**261**	169	0.8
33R2	12/2/2021	Lower	0.2	**670**	207	61	0.2
34C1	12/2/2021	Lower	0.2	**770**	**279**	83	0.3
19L5	12/7/2021	Lower	1.5	**1560**	**586**	120	0.7
3K1	11/18/21	Lower	25.7	**1190**	**371**	188	0.6
15H1	11/5/2021	Upper	ND	**4620**	**1850**	**550**	2.2
10A2	11/16/2021	Upper	**83.2**	**2400**	**962**	204	0.5
2J1	11/16/2021	Upper	**239**	**4710**	**1720**	**422**	1.7
12D1	12/1/2021	Upper	ND	**2460**	**809**	**325**	0.7

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

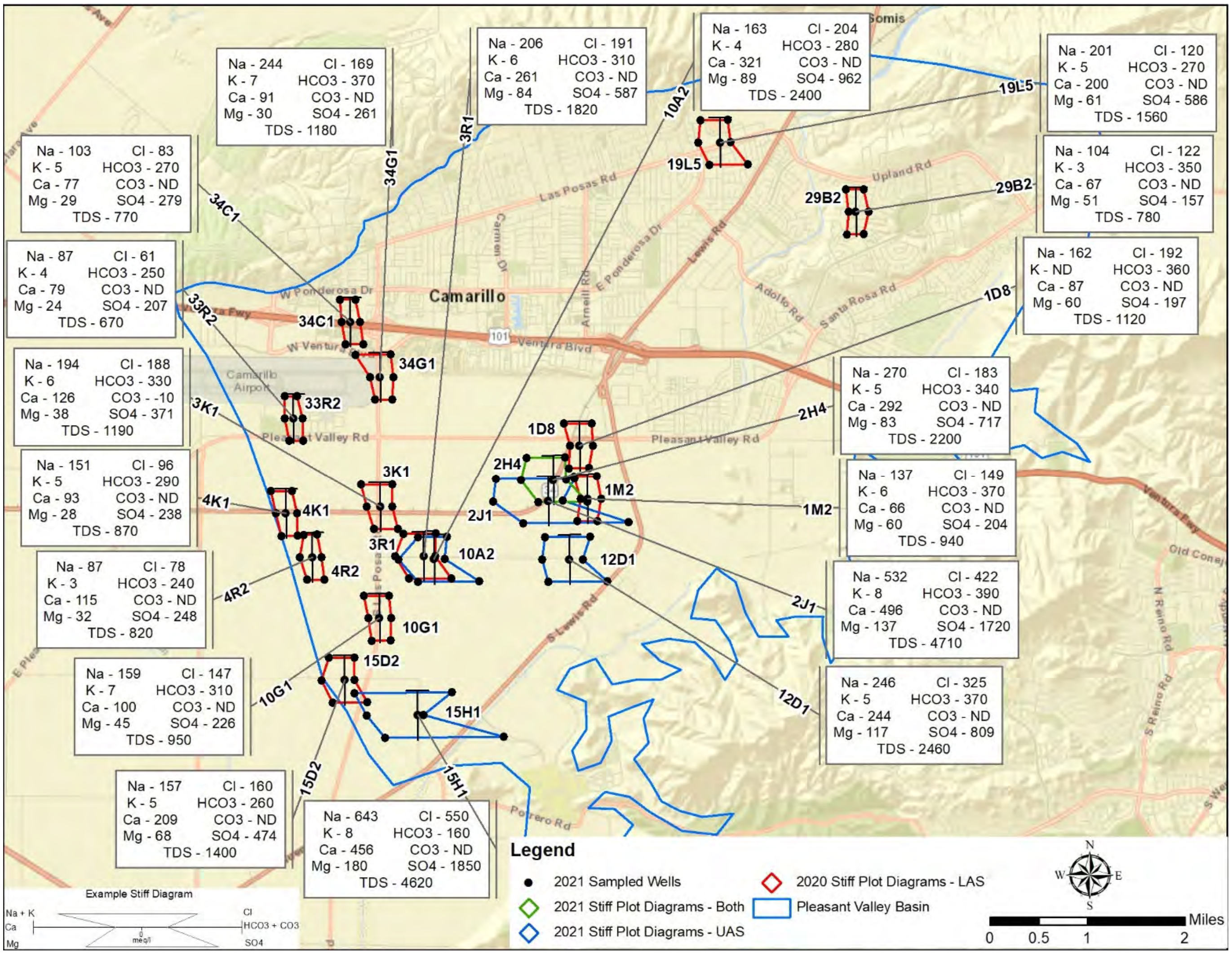


Figure 5-23: Pleasant Valley Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Santa Clara Valley River Basin – Santa Paula Subbasin (DWR Basin No. 4-004.04)

The Santa Paula Subbasin is a court adjudicated groundwater basin. To mitigate overdraft, a June 1991 judgment ordered the creation of the Santa Paula Basin Pumpers Association (SPBPA). The SPBPA regulates extractions in the Santa Paula Subbasin. The judgment stipulated an allotment of 27,000 acre-feet per year could be pumped from the Subbasin. Water quality in the Subbasin has not changed substantially since 2007. The depth to the water-bearing unit is 65 to 160 feet. There are approximately 295 water supply wells in the Santa Paula Subbasin, of which 151 are active. Water samples from eight wells in the basin were analyzed in 2021. The Piper diagram, **Figure E-14** shows no significant change in the water quality since previous sampling. Calcium is the dominant cation in three samples and there is no dominant cation in the remaining samples. Sulfate is the dominant anion; the water is calcium sulfate type. All eight samples had TDS and sulfate concentrations above the secondary MCL for drinking water (**Table 5-24**). Two samples were analyzed for Title 22 metals. No constituent was above the MCL. **Figure 5-25** shows approximate well location and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate for well sampled.

Figure E-20 compares water samples from the up-gradient Piru and Fillmore Subbasins to the Santa Paula Subbasin. The Piper diagram shows moderate variability among the samples. Filmore subbasin has higher variability than the Santa Paula and Piru subbasins, with higher calcium and lower sulfate concentrations but higher bicarbonate.

Table 5-23: Selected water quality results for the Santa Paula Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
21E11	9/13/2021	ND	**1440**	**568**	109	0.7
17Q01	9/13/2021	20	**1570**	**626**	82	0.6
09K04	9/13/2021	ND	**940**	**358**	45	0.4
30F01	9/13/2021	1.5	**1770**	**729**	91	0.6
35Q01	9/22/2021	38	**2630**	**1230**	104	0.9
36K07	9/22/2021	0.7	**1440**	**614**	77	0.4
03K02	9/22/2021	5.2	**1130**	**412**	71	0.5
03E01	9/22/2021	1.4	**2190**	**939**	100	0.5

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

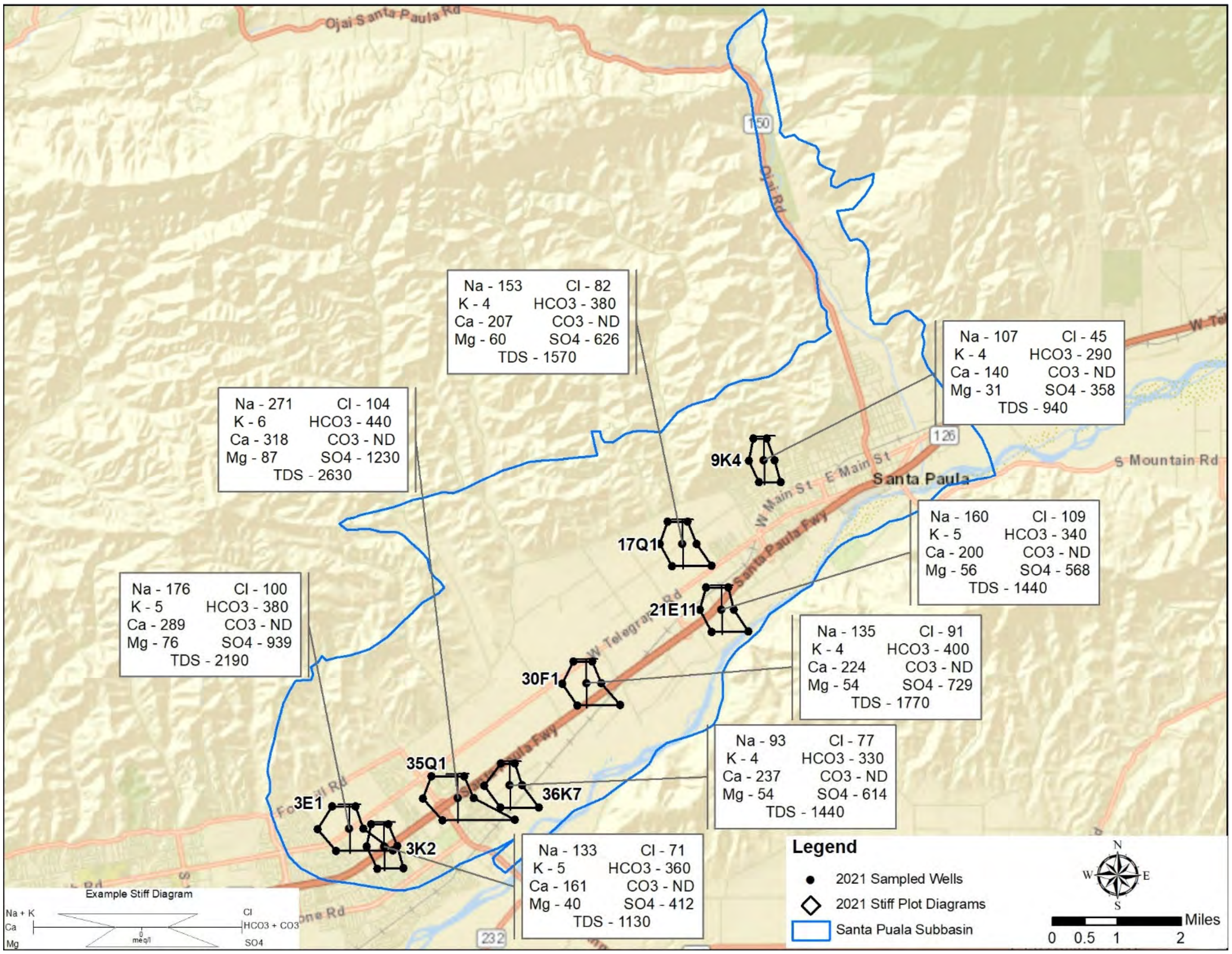


Figure 5-24: Santa Paula Subbasin sampled wells with Stiff diagrams and selected inorganic constituents.

Hidden Valley Basin (DWR Basin No. 4-016)

The Hidden Valley Basin consists mainly of fractured volcanic rock providing inconsistent groundwater supply throughout the basin because much of the water is stored in fractures. The water quality varies because of the heterogeneous nature of the aquifer. There are approximately 147 water supply wells in the basin, of which 96 are active. Water samples were collected from four wells in 2021. The Piper diagram in **Figure E-27** shows the chemistry of the samples which is highly variable considering the size of the basin. Calcium is the dominant cation in two samples; sodium is the dominant cation in one sample; and magnesium is the dominant cation in one sample. Bicarbonate is the dominant anion in all samples. The water is calcium bicarbonate type in two samples, sodium bicarbonate in one sample and magnesium bicarbonate in the remaining sample.

TDS concentration was above the secondary MCL for three samples (**Table 5-25**). Three samples were analyzed for Title 22 metals. All constituents were below the MCL for drinking water except one sample had arsenic at the MCL limit. **Figure 5-26** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-24: Selected water quality results for the Carpinteria Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
19H03	9/23/2021	ND	**520**	109	41	0.1
29E04	10/12/2021	ND	**580**	144	59	ND
25F04	10/19/2021	ND	350	36.6	32	0.1
25C01	10/19/2021	ND	**1180**	**287**	118	ND

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

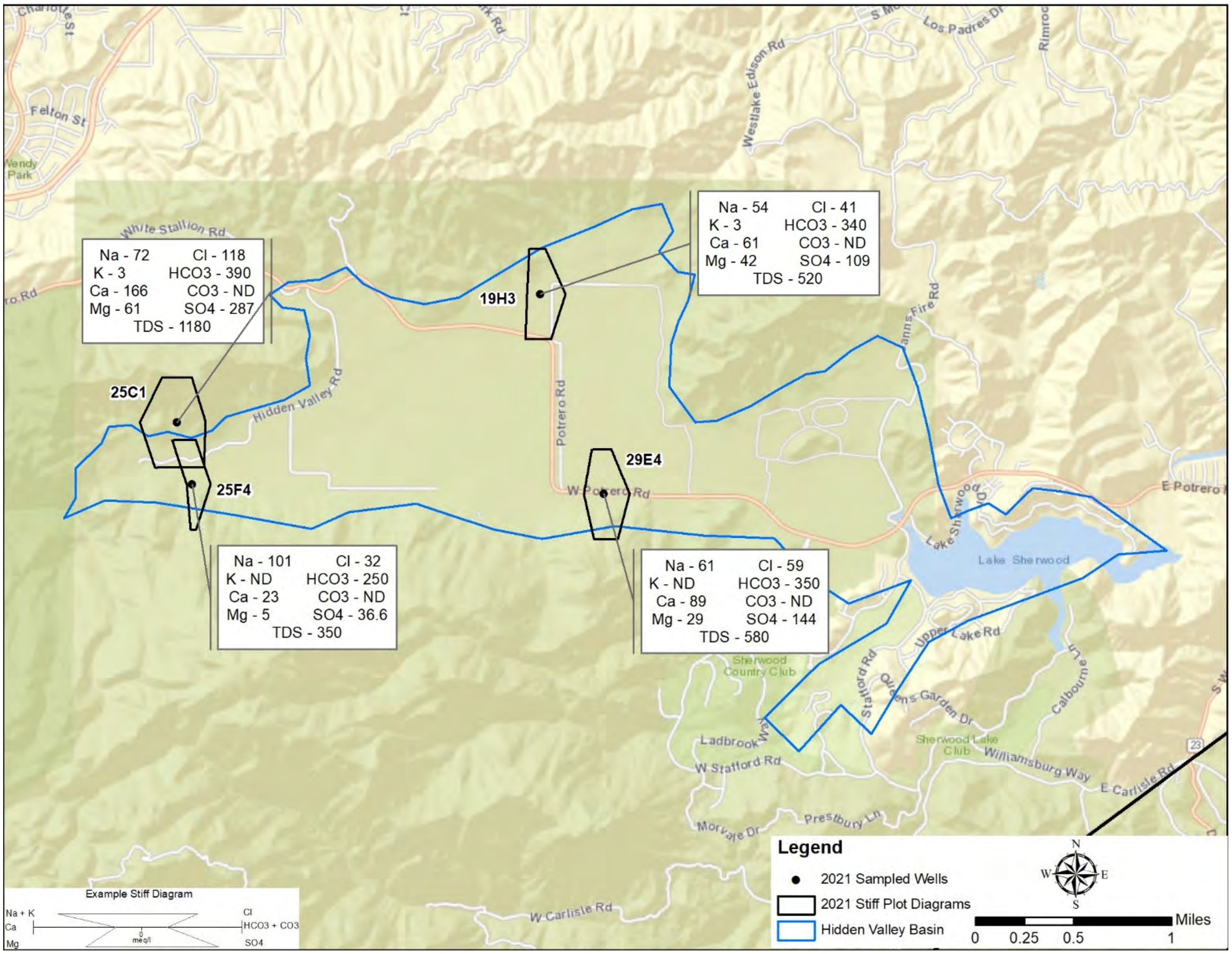


Figure 5-25: Hidden Valley Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Simi Valley Basin (DWR Basin No. 4-009)

The Simi Valley Basin drains to the west and historically, groundwater quality becomes more enriched in salts and therefore is of poorer quality further west in the basin. The four wells sampled are in the western end of the valley. There are approximately 182 water supply wells in the Simi Valley Basin, of which 35 are active wells. Depth to the water-bearing unit is approximately 5 to 25 feet bgs. The City of Simi Valley has a high water-table at the western end of the valley and several dewatering wells operate as needed to reduce the water table. The Piper diagram, **Figure E-15** shows low variability in water quality. There is no dominant cation, but the samples plot closely to the calcium type. Sulfate is the dominant anion in all four samples and the water is calcium sulfate type. TDS and sulfate concentrations were above the secondary MCL in all four samples. One sample had a nitrate concentration above the MCL. All four samples had chloride concentrations that could cause impairment of agricultural beneficial uses for sensitive plants but were not above the primary MCL. One water sample was analyzed for Title 22 metals; all constituents were below the MCL. **Figure 5-27** shows approximate well locations and concentrations of TDS, sodium potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate for wells sampled in the Simi Valley Basin.

Table 5-25: Selected water quality results for the Simi Valley Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
8D4	11/10/2021	18.7	**1720**	**766**	165	1.1
8K7	11/10/2021	**56.7**	**2070**	**972**	160	1
9E1	11/10/2021	29.1	**1630**	**764**	130	0.9
10A2	12/7/2021	**60.8**	**1930**	**721**	126	1.1

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

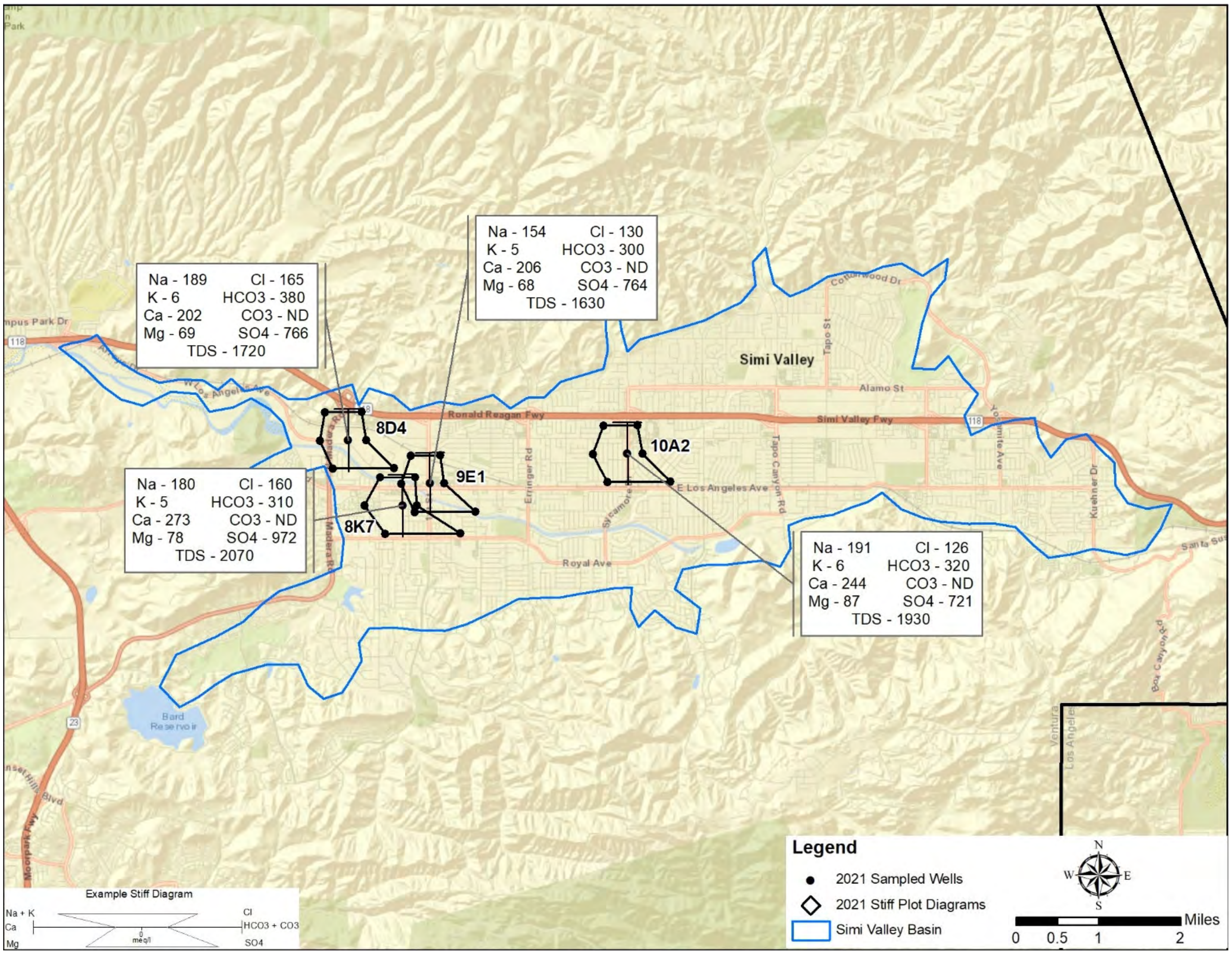


Figure 5-26: Simi Valley Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Tapo/Gillibrand Basin

The Tapo/Gillibrand Basin is located to the north of Simi Valley. The Tapo/Gillibrand Basin is an east-west trending structural basin that consists of permeable sand and gravel that occur near the center of the Happy Camp Syncline. The basin is bounded by the Santa Susana Fault to the north, the Simi Anticline to the south and impermeable sediments of the Sisquoc Formation and Monterey Shale in the remaining areas. There are approximately 46 water supply wells in the Tapo/Gillibrand Basin, of which 14 are active. The City of Simi Valley operates several wells in the basin for backup water supply. One well was sampled in this basin in 2021.

The Piper diagram, **Figure E-29** shows low variability in water quality. Calcium is the dominant cation, Sulfate is the dominant anion in the sample. The water is calcium sulfate type. TDS and sulfate concentrations are above the secondary MCL in both samples. One sample had manganese above the MCL. One water sample was analyzed for Title 22 metals; all constituents were below the MCL. **Figure 5-28** shows approximate well locations and concentrations of TDS, sodium potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate for wells sampled in the Simi Valley Basin.

Table 5-26: Selected water quality results for the Simi Valley Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
24C7	11/10/2021	10.8	**850**	**362**	28	ND

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

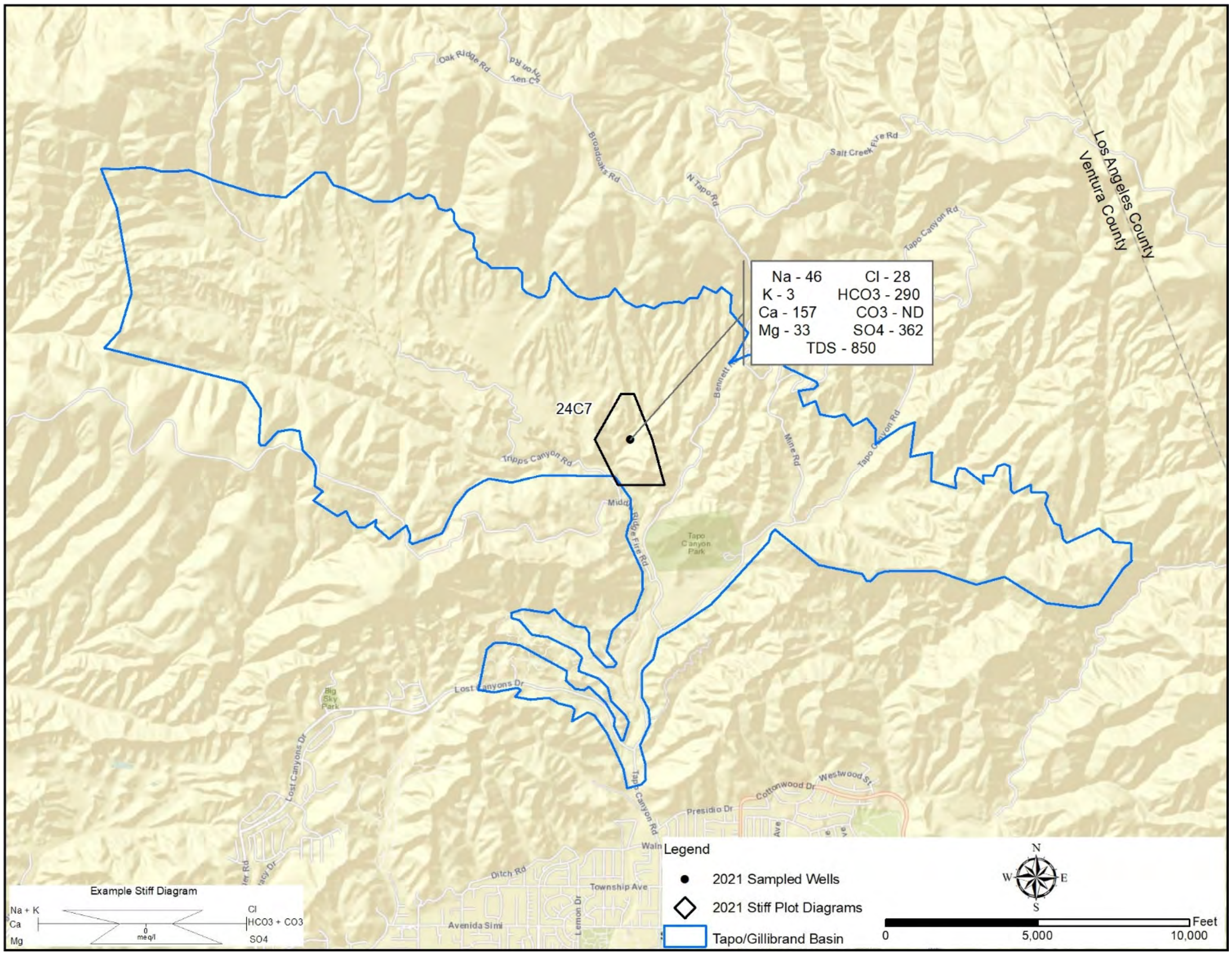


Figure 5-27: Tapo/Gillibrand Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Thousand Oaks Area Basin (DWR No. 4-019)

The Thousand Oaks Area Basin has very few active water wells available for sampling. The depth to the water-bearing unit is approximately 25 to 30 feet bgs. The groundwater basin underlies a small valley between Lake Sherwood and the City of Thousand Oaks, just east of Highway 23. Water-bearing formations are mainly alluvium and fractured Conejo Volcanics. There are approximately 119 water supply wells in the basin, of which 11 are active. No wells were sampled in this basin in 2021. **Figure 5-29** shows the extent of the Thousand Oaks Area Basin.

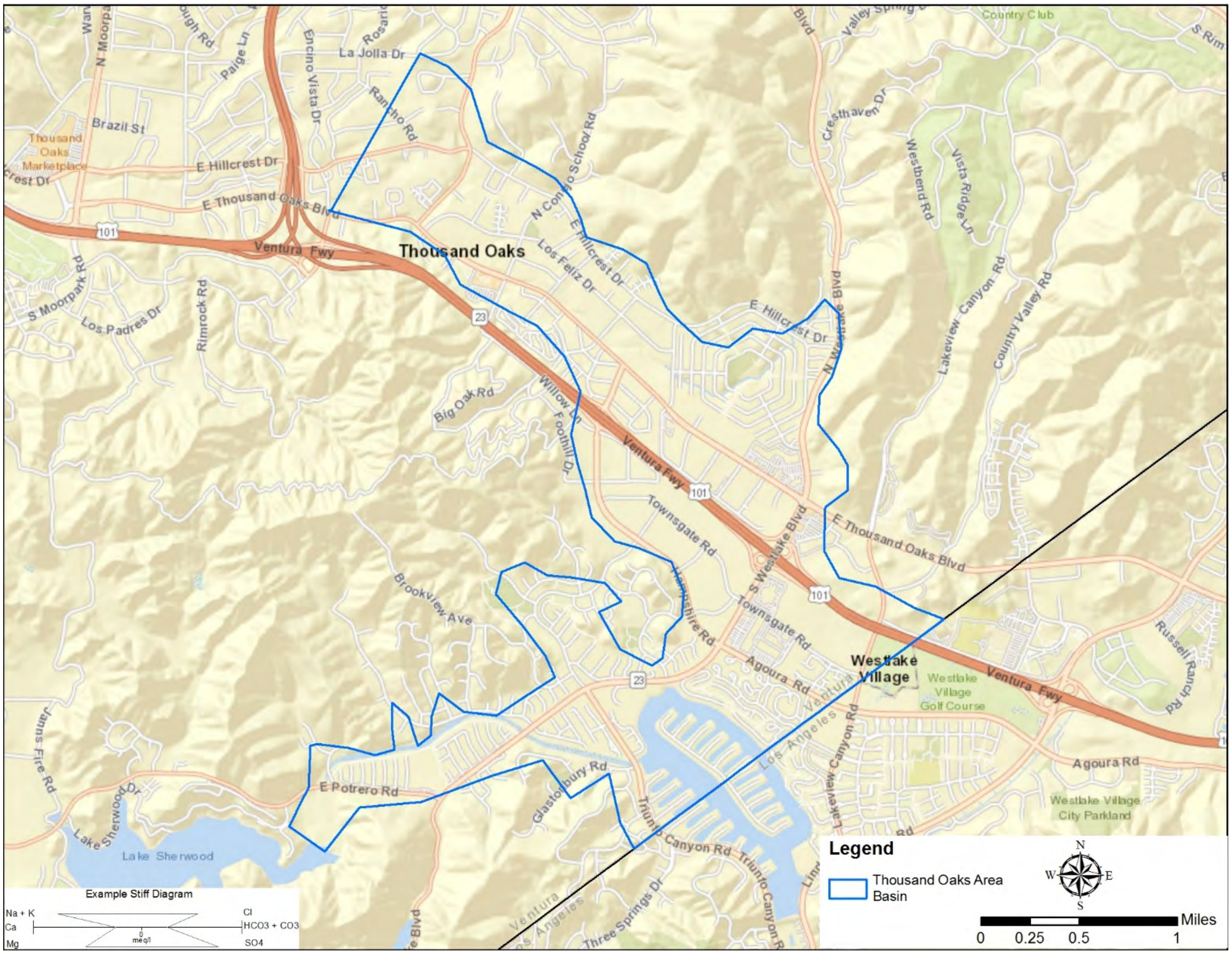


Figure 5-28: Thousand Oaks Area Basin.

Tierra Rejada Basin (DWR Basin No. 4-015)

Depth to water-bearing materials varies between 20 to 80 feet bgs. There are approximately 58 water supply wells in the Tierra Rejada Basin, of which 36 are active. Seven wells were sampled in 2021. The Piper diagram, **Figure E-16** shows low variation in water quality. There is no dominant cation. Bicarbonate is the dominant anion for one sample and the remainder have no dominant anion. Water samples from five wells are magnesium bicarbonate type, one well is magnesium sulfate type, and one well is calcium bicarbonate type. One well had a nitrate concentration above the primary MCL. Water from all seven wells had TDS concentrations above the secondary MCL, ranging from 640 to 1,250 mg/L. Three wells in the basin were analyzed for Title 22 metals and all constituents were below the primary MCL.

The Piper diagram, **Figure E-3** shows a comparison of water chemistry between Tierra Rejada and Arroyo Santa Rosa Basins. Chemistry in the two basins is similar but there is more variation in Tierra Rejada with slightly higher magnesium, bicarbonate and sulfate. **Figure 5-30** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-27: Selected water quality results for the Tierra Rejada Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
15N3	10/4/2021	0.9	**700**	164	80	ND
10R2	11/9/2021	9	**680**	174	76	ND
15B1	11/9/2021	3	**640**	152	81	ND
15J2	11/9/2021	34.4	**1250**	**334**	176	0.2
11J3	11/19/2021	22.4	**700**	147	58	0.2
14Q2	11/19/2021	ND	**720**	203	50	ND
14F1	12/1/2021	64.2	**810**	134	108	0.1

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

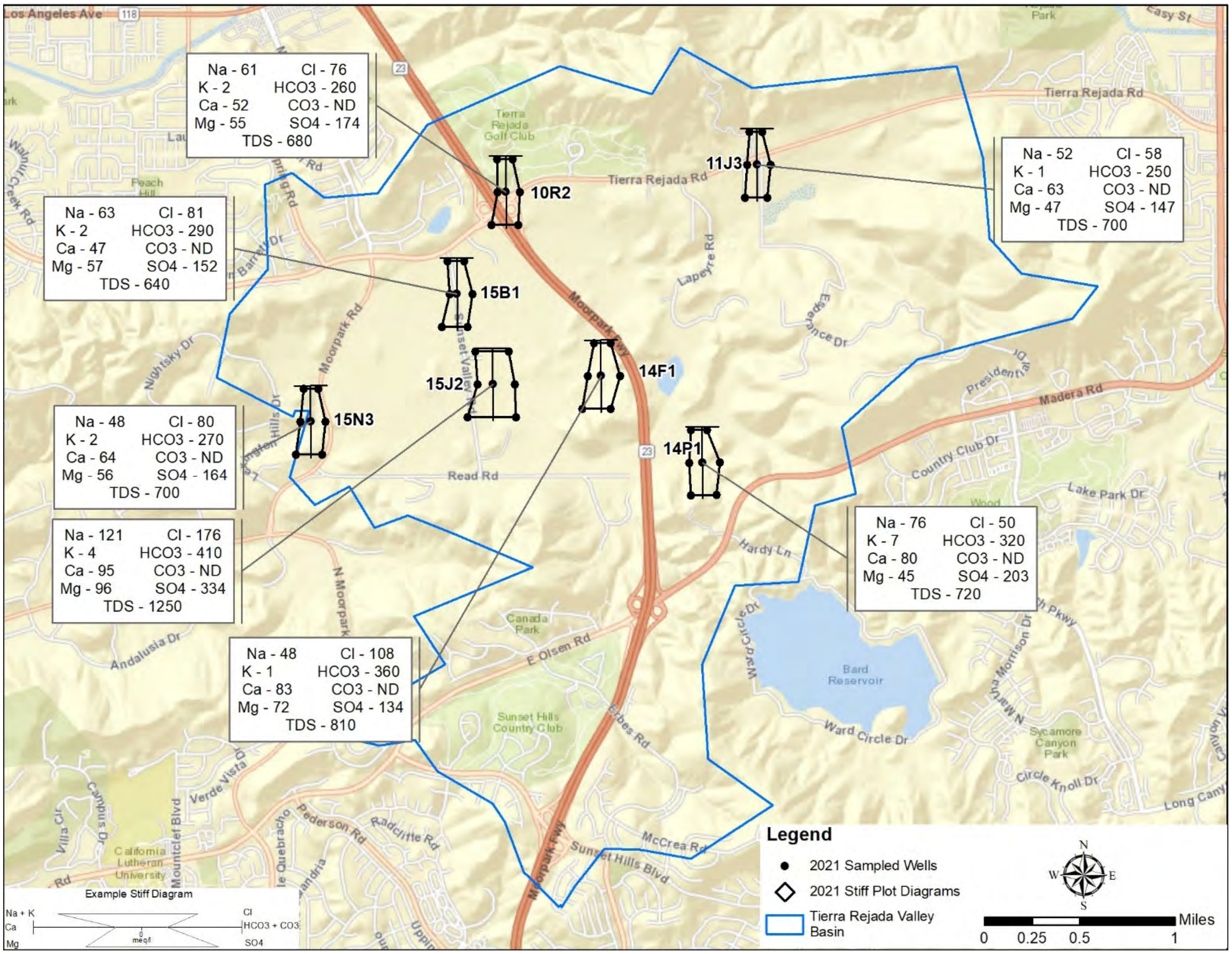


Figure 5-29: Tierra Rejada Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Figure 5-31 shows nitrate concentrations for wells sampled in the Tierra Rejada Basin in 2021. Groundwater from one well sampled has a nitrate concentration that exceeds the primary MCL. Other wells previously sampled with elevated nitrate concentrations were not available for sampling in 2021.

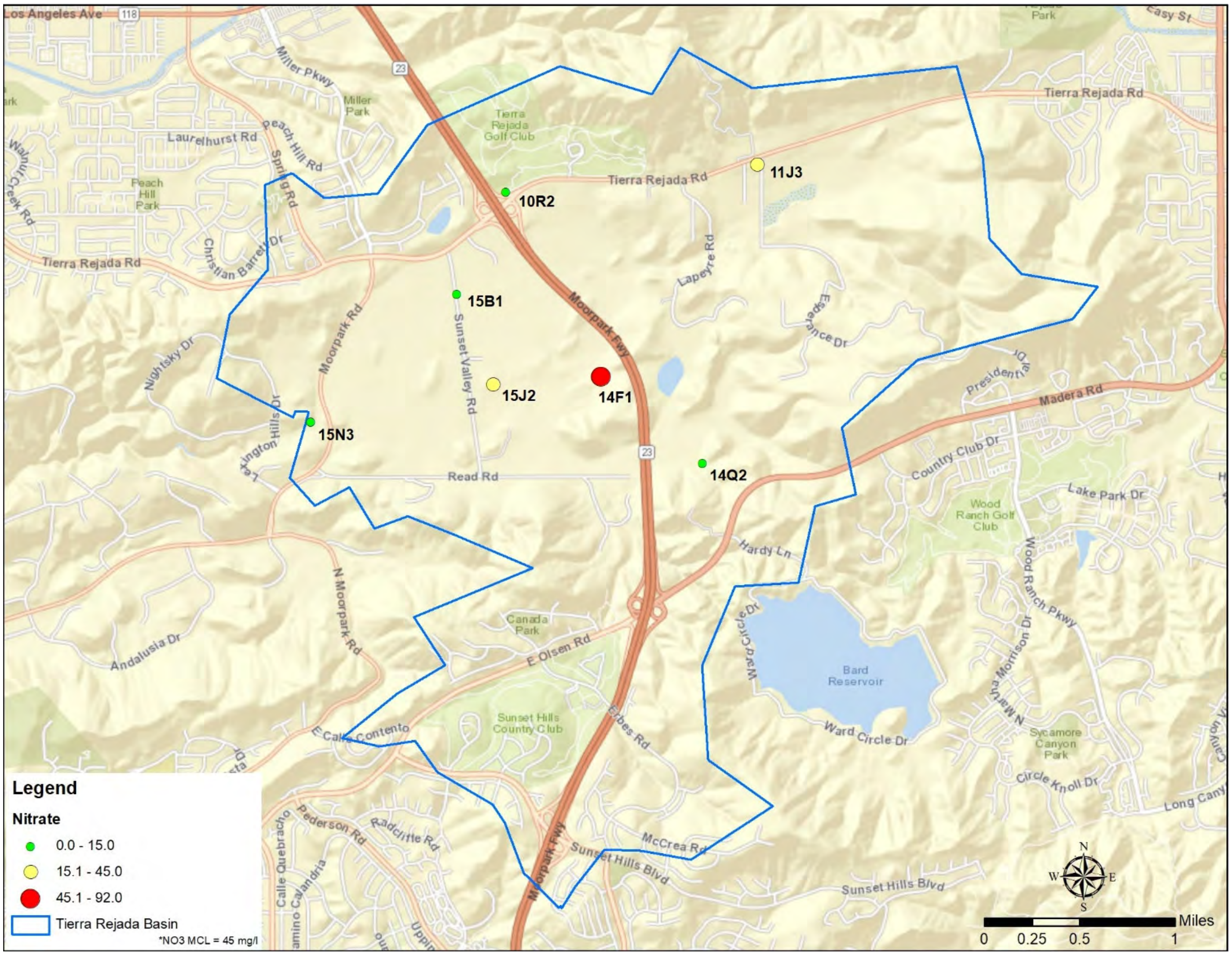


Figure 5-30: Tierra Rejada Basin location of sampled wells and nitrate concentrations.

Upper Ojai Valley Basin (DWR Basin No. 4-001)

The Upper Ojai Valley Basin is a small, linear valley southeast of and at a higher elevation than the Ojai Valley Basin. The average thickness of water-bearing deposits is approximately 60 feet and groundwater is encountered approximately 45 to 60 feet bgs. Groundwater quality is considered good but varies seasonally and usually has better quality during winter months. There are approximately 171 water supply wells in the Upper Ojai Valley Basin, of which 128 are active wells. Three wells were sampled in 2021. The Piper diagram, **Figure E-17** shows some variation in the water quality of the wells. Calcium is the dominant cation in one sample, there is no dominant cation in the remaining samples. Bicarbonate is the dominant anion in all samples. The water in two samples is calcium bicarbonate type and sodium sulfate in one sample. Two samples had TDS concentrations above the secondary MCL for drinking water (**Table 5-24**) and one sample had nitrate concentration above the primary MCL.

Three water samples were analyzed for Title 22 metals and all constituents were below the primary MCL. **Figure 5-32** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-28: Selected Water Quality Results for the Upper Ojai Basin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
11P2	10/14/2021	ND	240	3	14	ND
11J1	10/14/2021	**53.4**	**450**	90.8	38	ND
10K5	10/19/2021	11.9	**970**	199	122	0.4

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

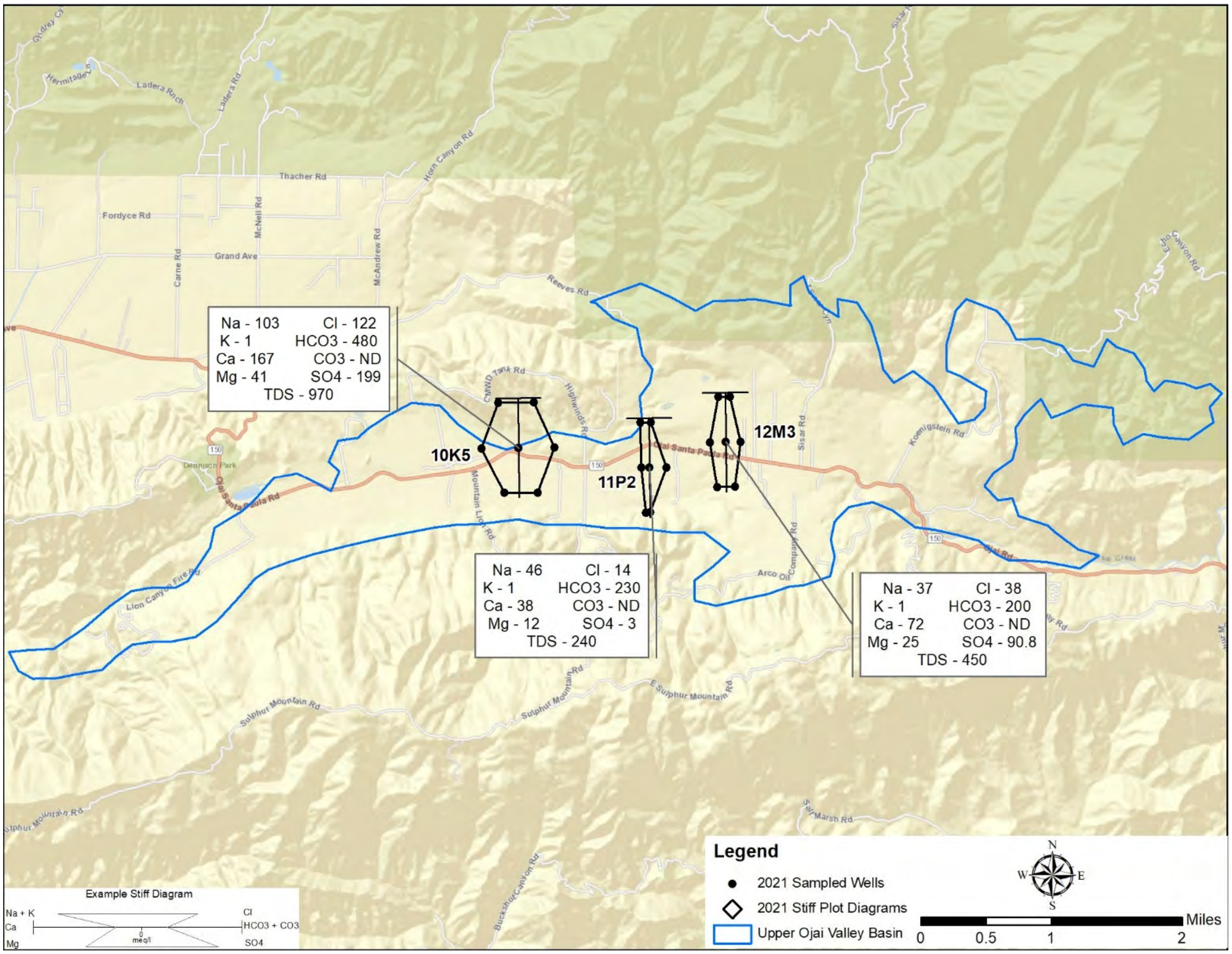


Figure 5-31: Upper Ojai Basin sampled wells with Stiff diagrams and selected inorganic constituents.

Ventura River Valley Basin – Lower Ventura River Subbasin (DWR Basin No. 4-003.02)

The Lower Ventura River Subbasin is bounded on the north by the Upper Ventura River Subbasin and extends south to the Pacific Ocean. The subbasin shares a common boundary with the Mound Subbasin at its lower reach. Canada Larga and several smaller tributary canyons are also part of the subbasin. The water-bearing unit consists of alluvial sand and gravel with abundant cobbles and ranges in thickness from 60 to 200 feet and perhaps up to 300 feet at the mouth of the Ventura River. The subbasin has few remaining active wells available for sampling. Depth to the water-bearing unit is 3 to 13 feet bgs in the floodplain and deeper as the ground surface elevation increases toward the edges of the subbasin. There are approximately 34 wells in the Lower Ventura River Basin, of which 21 are active. Three wells were sampled in 2021. The Piper diagram, **Figure E-18** shows the water quality of the samples. Sodium is the dominant cation in one sample. There is no dominant cation in the other samples. Bicarbonate is the dominant anion in one sample. There is no dominant anion in the other two samples. One water sample is sodium bicarbonate type, one sample is calcium sulfate type, and the remaining sample is sodium sulfate type. All three samples had TDS and two samples had sulfate concentrations that exceed the secondary MCL. One sample had a chloride concentration above the MCL for drinking water. All three samples had chloride concentrations that are above the level that could cause impairment of agricultural beneficial uses for sensitive plants.

One sample was analyzed for Title 22 metals. No constituents were above the MCL. **Figure 5-43** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate for the well. **Figure 5-33** shows approximate well locations and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate.

Table 5-29: Selected water quality results for the Lower Ventura River Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
5K1	09/15/2021	ND	**1030**	**321**	115	0.7
32Q8	09/15/2021	ND	**1860**	**585**	**305**	0.8
5F1	09/15/2021	ND	**790**	156	60	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

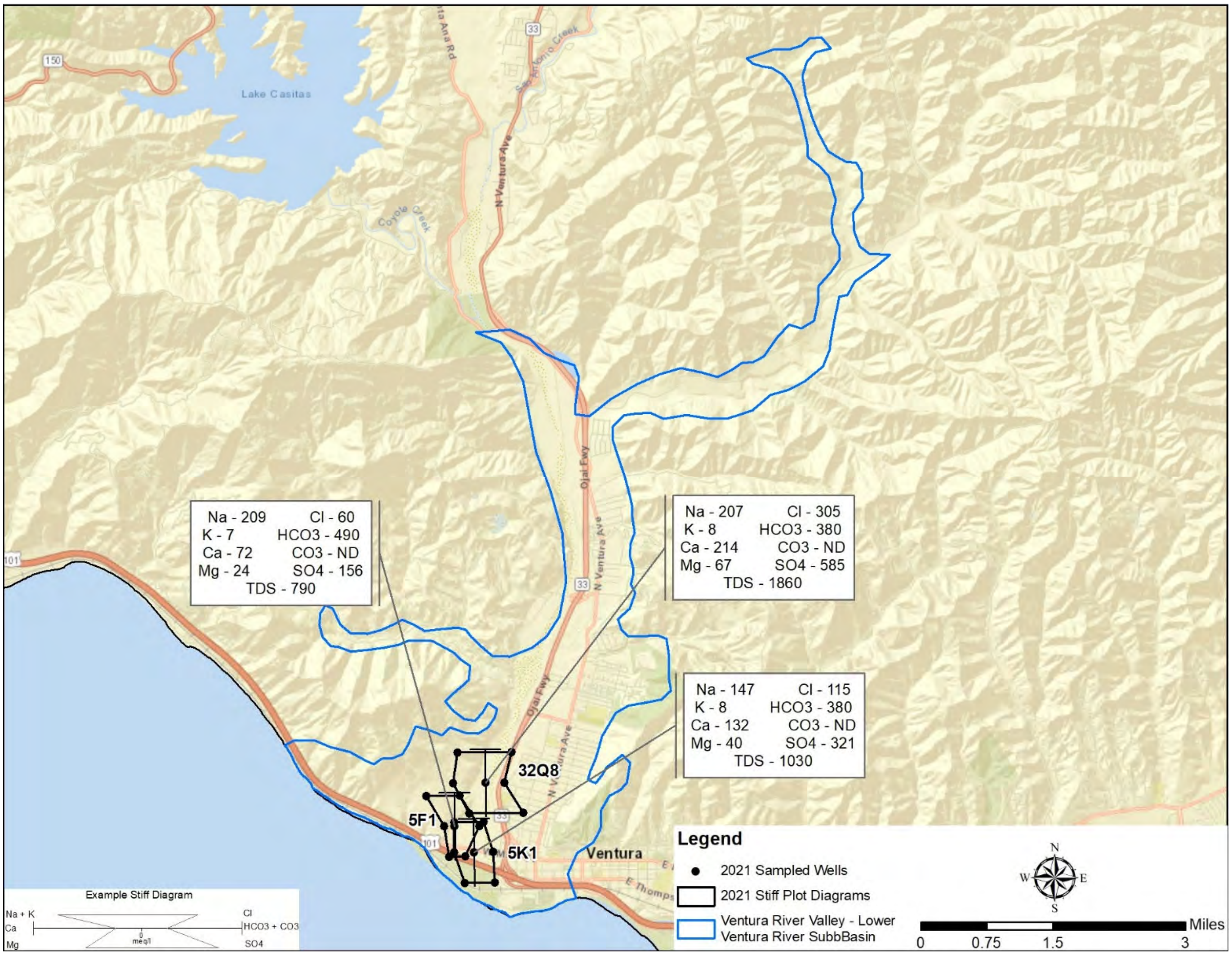


Figure 5-32: Ventura River Valley – Lower Ventura River Subbasin sampled well with Stiff diagram and selected inorganic constituents.

Ventura River Valley Basin – Upper Ventura River Subbasin (DWR Basin No. 4-003.01)

The Upper Ventura River Subbasin is mainly composed of thin alluvial deposits. There are approximately 202 water supply wells in the Upper Ventura River Subbasin, of which 118 are active. Two wells within the basin and one well just outside the basin were sampled in 2021. The Piper diagram, **Figure E-19** shows moderate variation in water quality among the samples. The dominant cation in two samples is calcium and the dominant cation in one sample is sodium. The dominant anion in one sample is bicarbonate and one sample is sulfate type. Two samples have no dominant anion. The water in two samples is calcium bicarbonate and, one sample is sodium bicarbonate type.

All three water samples had TDS concentrations that exceed the secondary MCL; one sample had a sulfate concentration that exceeded the secondary MCL. No wells were analyzed for Title 22 metals. **Figure 5-34** shows the approximate well location and concentrations of TDS, sodium, potassium, calcium, magnesium, chloride, bicarbonate, carbonate and sulfate for the well.

Table 5-30: Selected water quality results for the Upper Ventura River Subbasin.

Well No.	Date Sampled	Nitrate as NO3 (mg/L)	TDS (mg/L)	Sulfate (mg/L)	Chloride (mg/L)	Boron (mg/L)
9G3	09/17/2021	37.7	**810**	195	90	0.4
15A2	09/17/2021	13.2	**580**	149	109	0.4
33M2 (outside basin)	09/17/2021	ND	**1350**	**382**	144	0.6

Notes:
1. mg/L = milligrams per liter
2. ND = not detected
3. Bold numbers indicate concentration above primary or secondary MCL

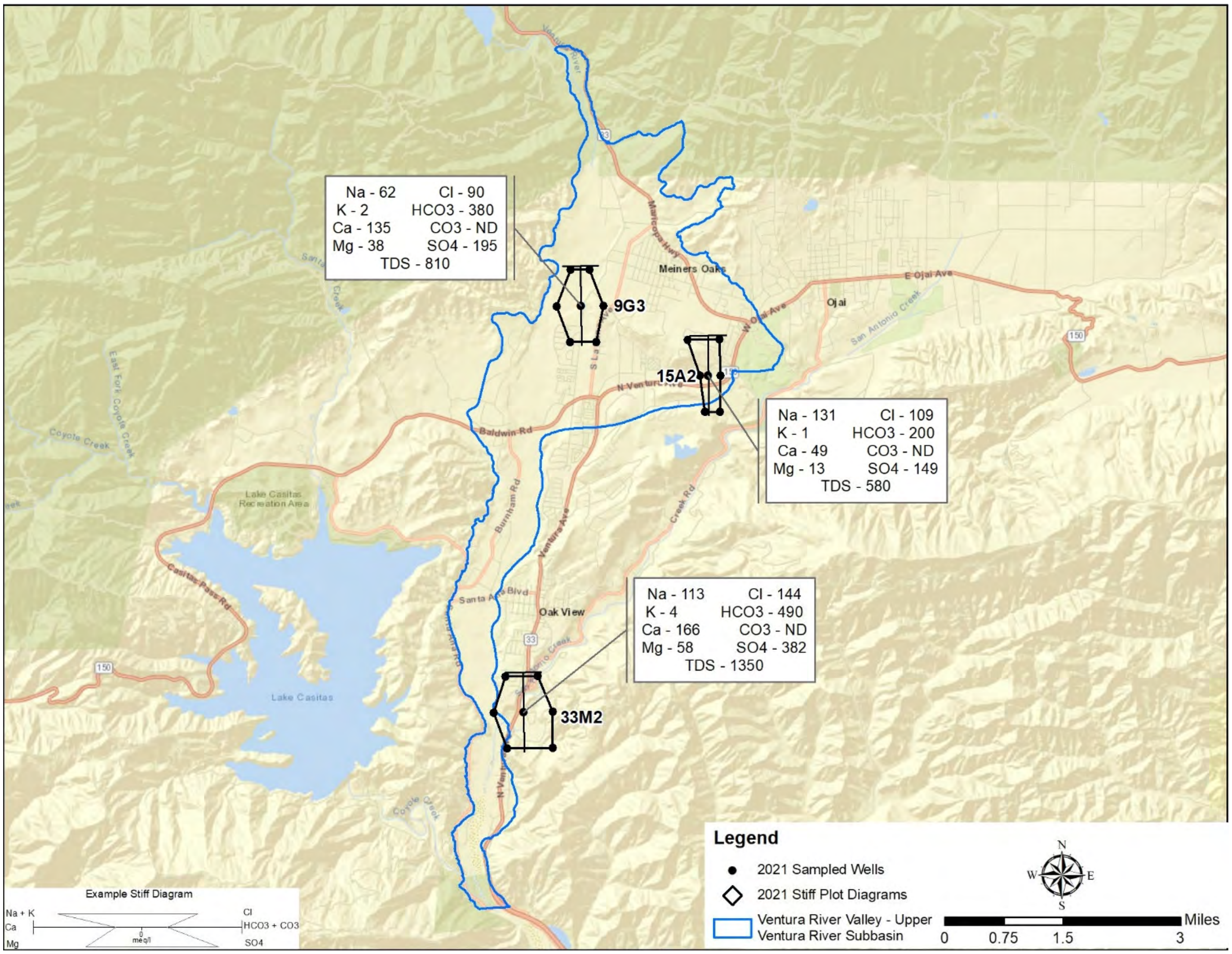


Figure 5-33: Ventura River Valley – Upper Ventura River Subbasin sampled well with Stiff diagram and selected inorganic constituents.

6.0 Groundwater Elevations

Groundwater elevations are measured in production and monitoring wells throughout the County. Water levels are tracked to determine change in storage and trends in groundwater extraction and recharge. Elevation data are shared with and provided by other organizations and agencies. The data are also used to generate groundwater elevation maps to determine the direction of groundwater movement. Collected data are publicly available.

In 2021 approximately 200 wells throughout the County (**Figures 6-1 and 6-2**) were gauged, including seventeen designated as "key" wells, considered to represent groundwater elevations over a broad area of the groundwater basin. Key wells[7] were chosen based on location in a basin, availability of construction information and historical water level data. Water levels are measured quarterly in the southern half of the County and water levels in the northern half are measured bi-annually.

Gauged wells include abandoned wells that are not in operation and active wells that were not pumping for at least 24 hours prior to water level gauging. The same wells are attempted to be gauged each year. Well availability is dependent on owner permissions and times of operation. When a well is not available for gauging, an alternative well is identified. Replacement wells must be nearby, of a similar depth and have the same perforation intervals.

[7] Appendix B includes the location of key wells, water level changes and hydrographs.

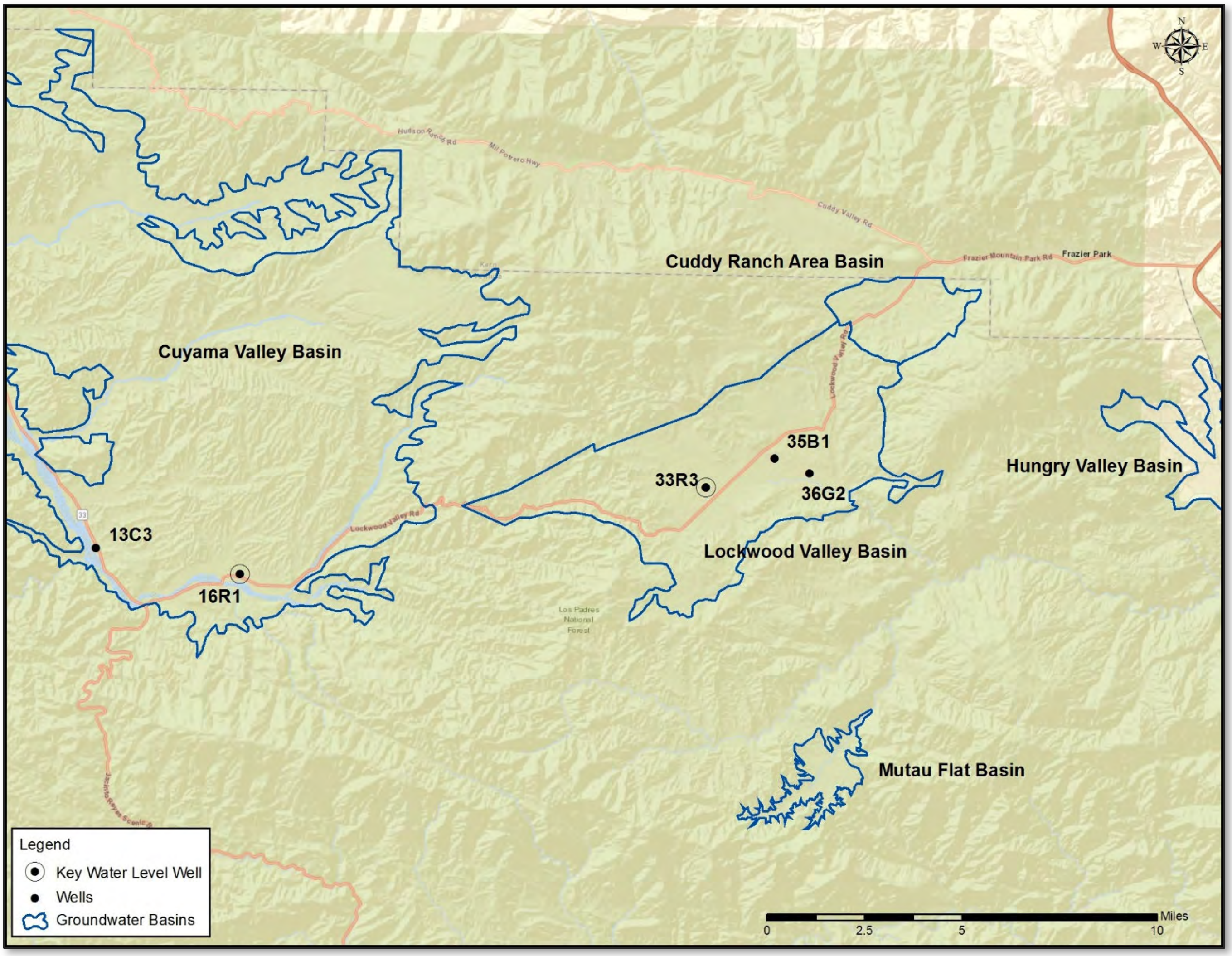


Figure 6-1: Water level wells measured in the northern half of the County.

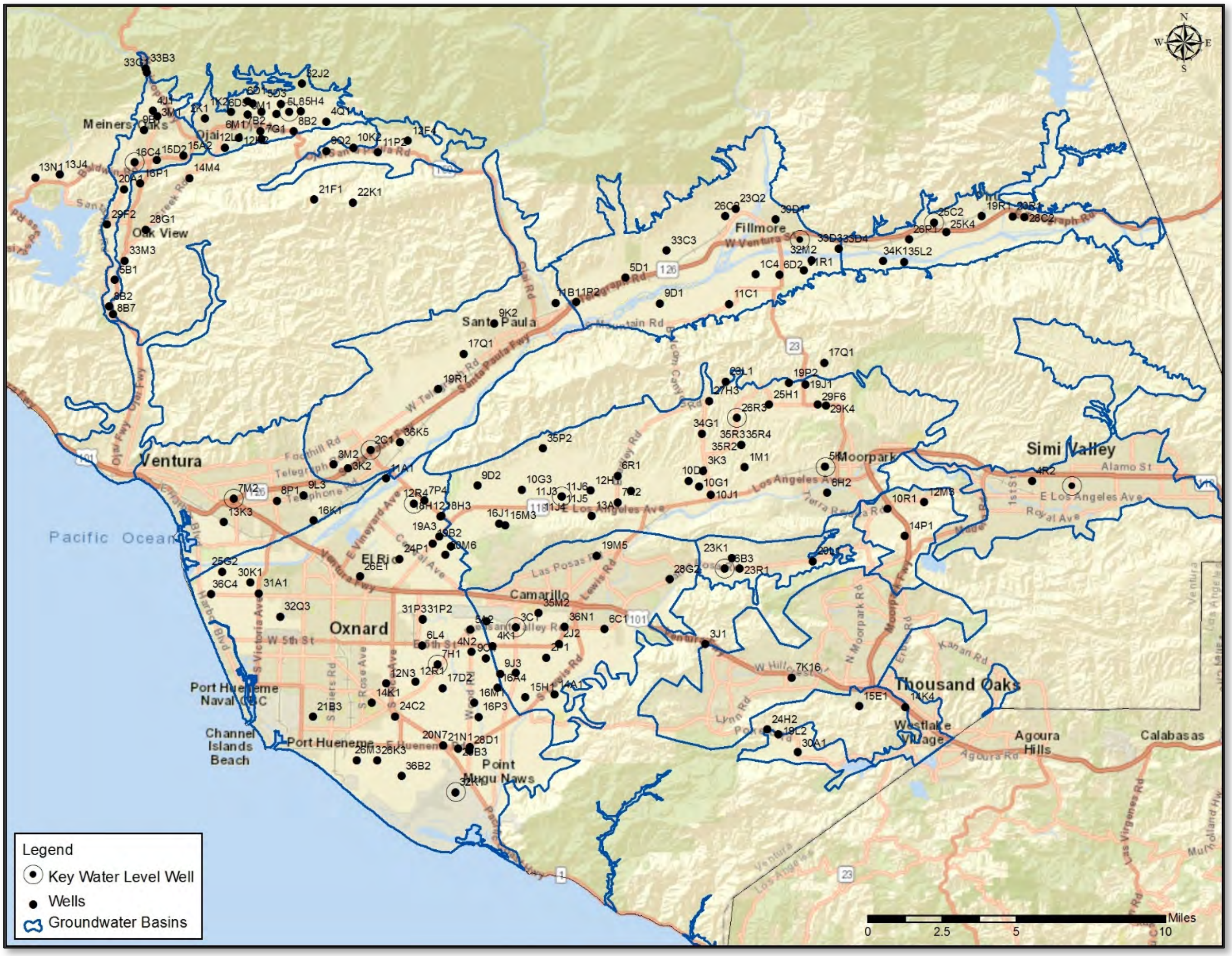


Figure 6-2: Water level wells measured in the southern half of the County.

Water Level Hydrographs

The gauged wells include wells that are not in operation and active wells that were not pumping for at least 24 hours prior to water level gauging. The same wells are consistently gauged; however, alternative wells are substituted when primary wells cannot be gauged. The data along with climate, stream flow, groundwater recharge, groundwater quality and pumping data are used to evaluate groundwater conditions. Hydrographs for all key wells are shown in **Appendix B**. An example hydrograph for Well No. 01N21W02J02S is shown in **Figure 6-3**.

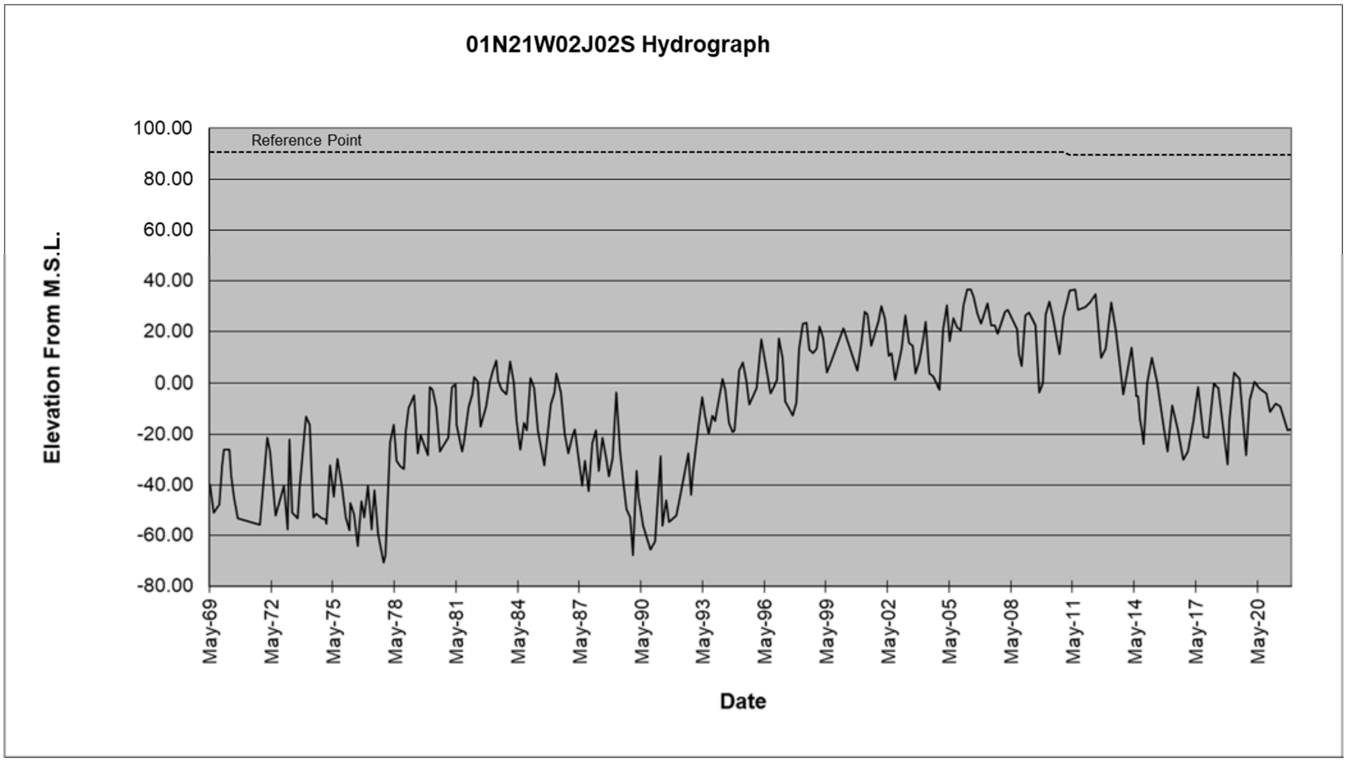


Figure 6-3: Hydrograph showing the groundwater elevation through time for Well No. 01N21W02J02S, located in the Pleasant Valley Basin.

*reference point = the elevation of the measuring point of the well.

Spring Groundwater Elevation Changes in Key Wells

Locations of each key well are shown in **Figure 6-4**. Key water level changes for the largest groundwater basins are summarized in **Table 6-1**. The information is used to track depth to groundwater trends. Spring season measurements are used for comparison since this time period is typically at the end of the seasonal rainfall year when groundwater basins are typically full. The measurements in the table are static water level measurements, in feet below the reference point, obtained after the water pump has been off for a minimum of 24 hours prior to gauging. In general, recent groundwater levels in Ventura County have shown a downward trend due to exceptional drought conditions and increased extraction of groundwater.

Hydrographs (line graphs) of individual key wells are presented in **Appendix B**. Hydrographs show changes in groundwater elevation relative to mean sea level and are measured in feet bgs or a specific reference point (RP), typically on the magnetic north side at the top of the well casing or the concrete slab at the wellhead. The hydrographs are accompanied by a bar graph to track changes from the previous year.

Figure 6-4: Key water level wells in Ventura County.

Table 6-1: Key water level changes in feet below ground surface for 2021.

DEPTH TO GROUND WATER LEVEL CHANGES AT KEY WELLS IN VENTURA COUNTY							
		HISTORIC					
Groundwater Basin	**WELL NUMBER**	**RECORD HIGH (ft.)**	**RECORD LOW (ft.)**	**LEVEL (ft.)**	**LEVEL (ft.)**	**LEVEL (ft.)**	**Change From Previous Year (ft.)**
	(Period of RECORD)	**(DATE)**	**(DATE)**	**(YEAR 2019)**	**(YEAR 2020)**	**(YEAR 2021)**	**(UP/DOWN)**
Oxnard Plain							
Oxnard Aquifer	01N21W07H01S	3.4	88.4	56.3	46.4	48.1	DOWN 1.7
	(Jan.1931-present)	(3/1999)	(9/1964)	(3/13)	(3/26)	(3/9)	
Fox Canyon Aquifer	01N21W32K01S	18	129	60.7	67.4	74.0	DOWN 6.6
	(Dec. 1972-present)	(4/1983)	(12/1990)	(3/18)	(3/16)	(3/15)	
Forebay Management Area (Measured By UWCD)	02N22W12R04S	16.2 ft.	Dry	106.14	108.75	125	DOWN 16.3
	(Mar 1996-present)	(5/2006)	(7/2014 - ?)	(4/16)	(3/26)	(3/16)	
Pleasant Valley Lower System	01N21W03C01S	87.5	253.9	153.9	146.5	157.3	DOWN 10.8
	(Feb.1973-present)	(8/1995)	(11/1991)	(3/15)	(3/26)	(3/9)	
West Las Posas	02N21W11J04S	368.4	406.2	407.7	410.2	419.1	DOWN 8.9
	(Jan.1991 - Present)	(6/2006)	(9/2016)	(3/25)	(4/3)	(3/9)	
East Las Posas	03N20W35R02S	352.6	487.4	423.8	419.5	428.5	DOWN 9.0
	(Oct. 1992-present)	(2/2005)	(6/2010)	(3/25)	(6/10)	(3/10)	
Santa Rosa Valley	02N20W26B03S	13.2	60.3	54.5	52.7	43.7	UP 9.0
	(Oct.1972-present)	(4/1979)	(11/2004)	(6/5)	(3/31)	(3/17)	
Simi Valley	02N18W10A02S	45	92	86.3	85.8	92.8	DOWN 7.0
	(Dec.1984-present)	(2/1998)	(6/1992)	(3/29)	(3/27)	(3/26)	
Ventura River	04N23W16C04S	3.9	101.9	39.3	44	44.7	DOWN 0.7
	(July 1949-present)	(3/1983)	(12/2016)	(3/20)	(3/2)	(3/2)	
Ojai Valley	04N22W05L08S	38.2	312	160.1	142.9	196.4	DOWN 53.5
	(Oct.1949 - Present)	(4/1978)	(9/1951)	(4/1)	(3/3)	(3/16)	
Mound (Measured by UWCD)	02N22W07M02S	126.6	176.2	173.7	171.9	171.5	UP 0.4
	(Apr.1996-present)	(4/1998)	(4/1996)	(3/6)	(3/12)	(3/17)	
Santa Paula	03N21W17Q01S	80.2	140.3	98.51	101.8	105.75	DOWN 4.0
	(Oct.1972-present)	(4/1983)	(12/1998)	(3/12)	(3/6)	(3/18)	
Fillmore	03N20W05D01S	107.8	163.7	131.8	131.9	136.3	DOWN 4.4
	(Oct.1972 - Present)	(2/1979)	(1219/77)	(3/12)	(3/6)	(3/18)	
Piru	04N19W25C02S	43.1	183.2	94.6	71	79.2	DOWN 8.2
	(Sep.1961-present)	(3/1993)	(10/1965)	(3/11)	(3/9)	(3/18)	
Lockwood Valley	08N21W33R03S	17.5 ft.	59.6 ft.	52.3	59.6	57.2	UP 2.4
	(April1966-present)	(9/1998)	(4/2020)	(4/19)	(4/24)	(4/30)	
Cuyama Valley	07N23W16R01S	15.0	47.5	26.1	24.7	25.9	DOWN 1.2
	(Mar.1972-present)	(4/1993)	(9/1990)	(4/19)	(4/24)	(4/1)	

Data prepared: 2/15/2022

The following summary is based on information gathered from key wells as shown in **Table 6-1**.

The Forebay Management Area of the Oxnard Subbasin responds quickly to seasonal and annual changes in precipitation and recharge. The Forebay Area key well (UWCD monitoring well) was down 16.3 feet from the 2020 spring measurement and was dry.

The water level in the Oxnard Subbasin, Oxnard Aquifer key well was up 1.7 feet from the previous spring. The water level in the Oxnard Subbasin, Fox Canyon Aquifer key well was down 6.6 feet from the 2020 spring measurement.

In the Pleasant Valley lower aquifer system, the water level in the key well was down 10.8 feet from spring 2020.

In the Las Posas Valley Basin, the EMA key well water level was down 9.0 feet from 2020. The key well for the WMA was down 8.9 feet from 2020.

In the Arroyo Santa Rosa Valley Basin, the water level was up 9.0 feet from 2020. The water level in the Simi Valley Basin key Well was down 7.0 feet from 2020. The water level in the Simi Valley key well has been on a downward trend over the last ten years (2012-2021).

In the northern portion of the Upper Ventura River Subbasin, the water level in key Well No. 04N23W16C04S was down 0.7 feet from 2020. In the Ojai Valley Basin, the water level in key Well No. 04N22W05L08S was down 53.5 feet from 2020. The Ojai Valley Basin responds quickly to rainfall or the lack of rainfall, and it is not uncommon to see large drops in water levels during dry periods and recovery at, or above, normal levels during wet periods (see Hydrograph in **Appendix B**).

The subbasins that underlie the Santa Clara River Valley also respond quickly to fluctuations in annual rainfall. The water level elevation in the Piru Subbasin key well was down 8.2 feet from 2020. The water level in the Fillmore Subbasin key well was down 4.4 feet, and in the Santa Paula Subbasin the water level in the key well was down 4.0 feet from 2020. In the Mound Subbasin the water level in key Well No. 02N22W07M02S was up 0.4 feet from 2020.

In the northern half of the County, the Lockwood Valley Basin key Well No. 08N21W33R03S was up 2.4 feet from 2020. The water level in the Cuyama Valley Basin key Well No. 07N23W16R01S was down 1.2 feet from 2020.

Potentiometric Surface Maps

Potentiometric surface maps (groundwater elevation maps) are used to visually represent groundwater elevations over specific geographic areas. Potentiometric surface maps are constructed from groundwater elevation data collected in spring and fall periods at County gauged wells and those gauged by other organizations/agencies.

Generalized potentiometric surface maps created from 2021 groundwater elevation data include:

a) The Santa Clara River Valley Basin,
b) The UAS of the Oxnard Subbasin and Pleasant Valley Basin, and
c) The LAS of the Oxnard Subbasin, Pleasant Valley, and Las Posas Valley Basins.

Figures 6-5 and 6-6 depict the Santa Clara River Valley Basin that encompasses the Mound, Santa Paula, Fillmore and Piru groundwater Subbasins. The basin area was truncated to include only the extent of the alluvial area of the valley instead of the full groundwater basin boundary.

Figures 6-7 and 6-8 depict the UAS of the Oxnard Subbasin and Pleasant Valley Basin area.

In the Pleasant Valley Basin, the UAS is not typically present, but there are areas of shallow alluvial sediments similar to Oxnard and Mugu Aquifer units from which wells are extracting groundwater. Well data from the perched or semi-perched zone of the Oxnard Subbasin was not used to generate these contours. Some water levels represent confined conditions.

Figures 6-9 and 6-10 depict the LAS of the Oxnard Subbasin, Pleasant Valley and Las Posas Valley Basins. The Moorpark anticline was used in previous Annual Reports as a boundary between the East and South Las Posas Basins. The South Las Posas Basin is no longer recognized, and the Las Posas Valley Basin is divided into the East and West Las Posas Management Areas (ELPMA and WLPMA, respectively). The potentiometric surface is mapped to reflect a “no-flow” barrier between the ELPMA and WLPMA. Data from wells perforated in the shallow sand and gravel zones of the Las Posas Valley were not used to generate these contours.

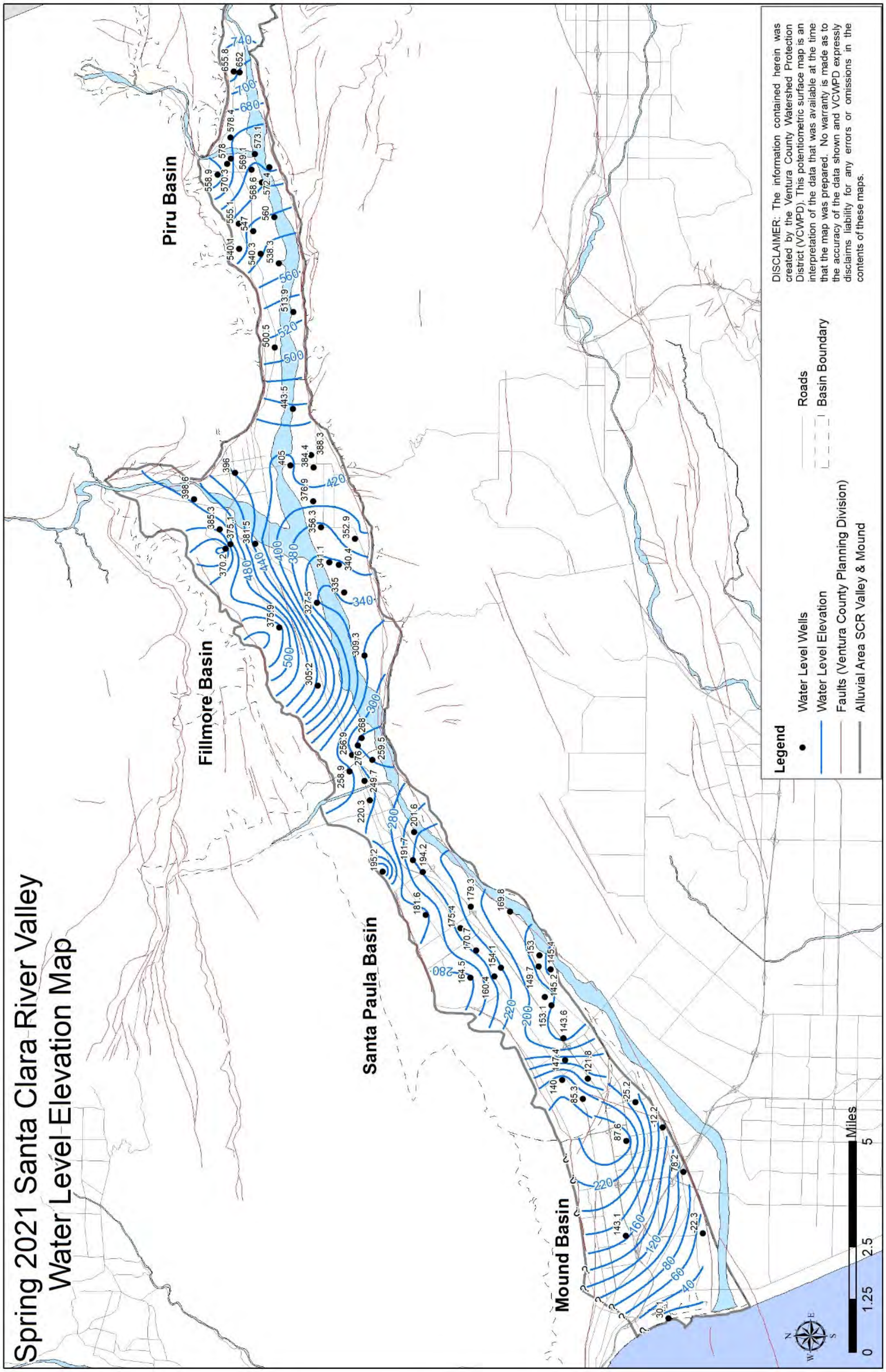


Figure 6-5: Water level surface elevation contours for the Santa Clara River Valley Basin for spring 2021.

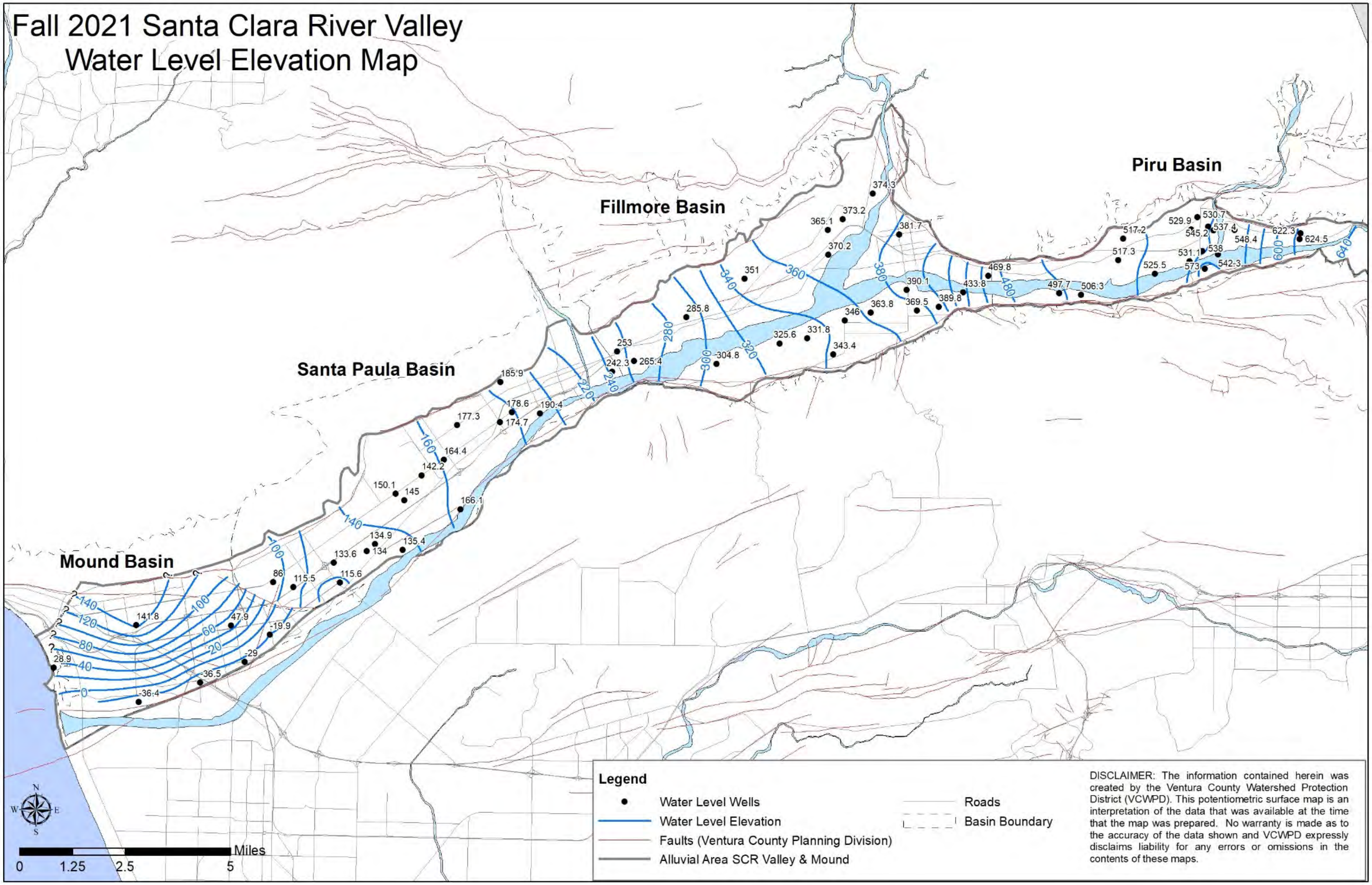


Figure 6-6: Water level surface elevation contours for the Santa Clara River Valley Basin for fall 2021.

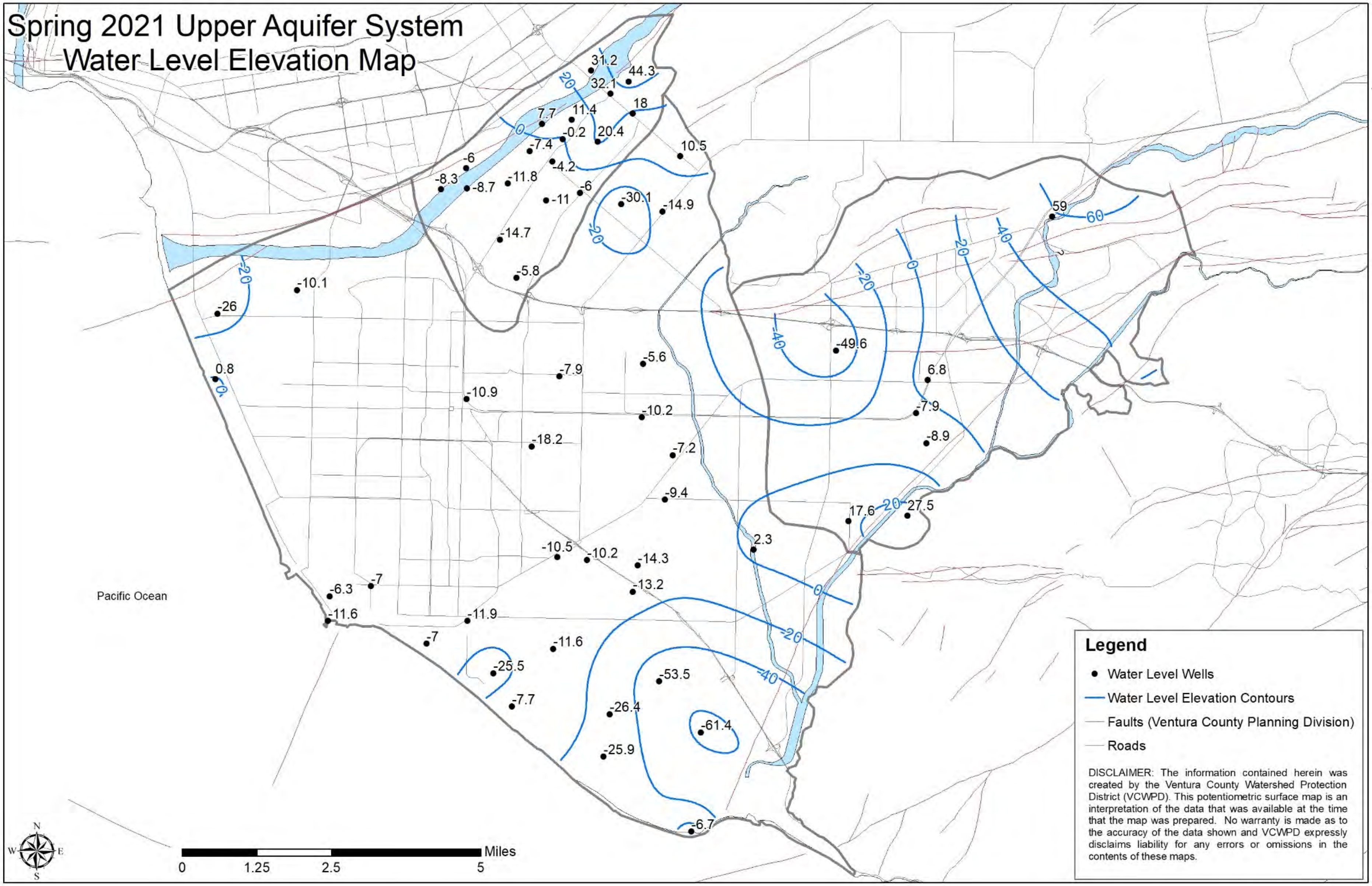


Figure 6-7: Water level surface elevation contours for the Upper Aquifer System for spring 2021.

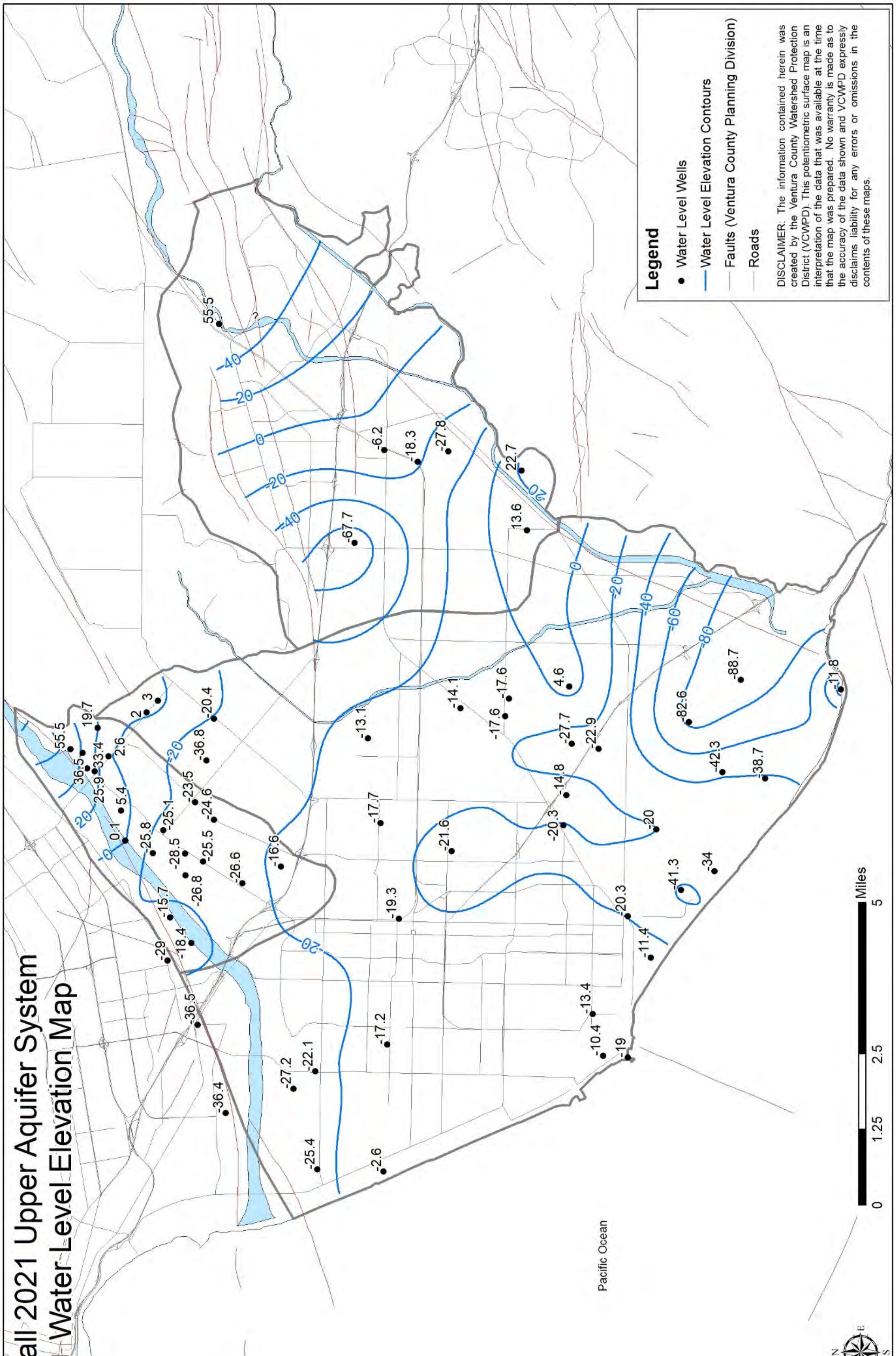


Figure 6-8: Water level surface elevation contours for the Upper Aquifer System for fall 2021.

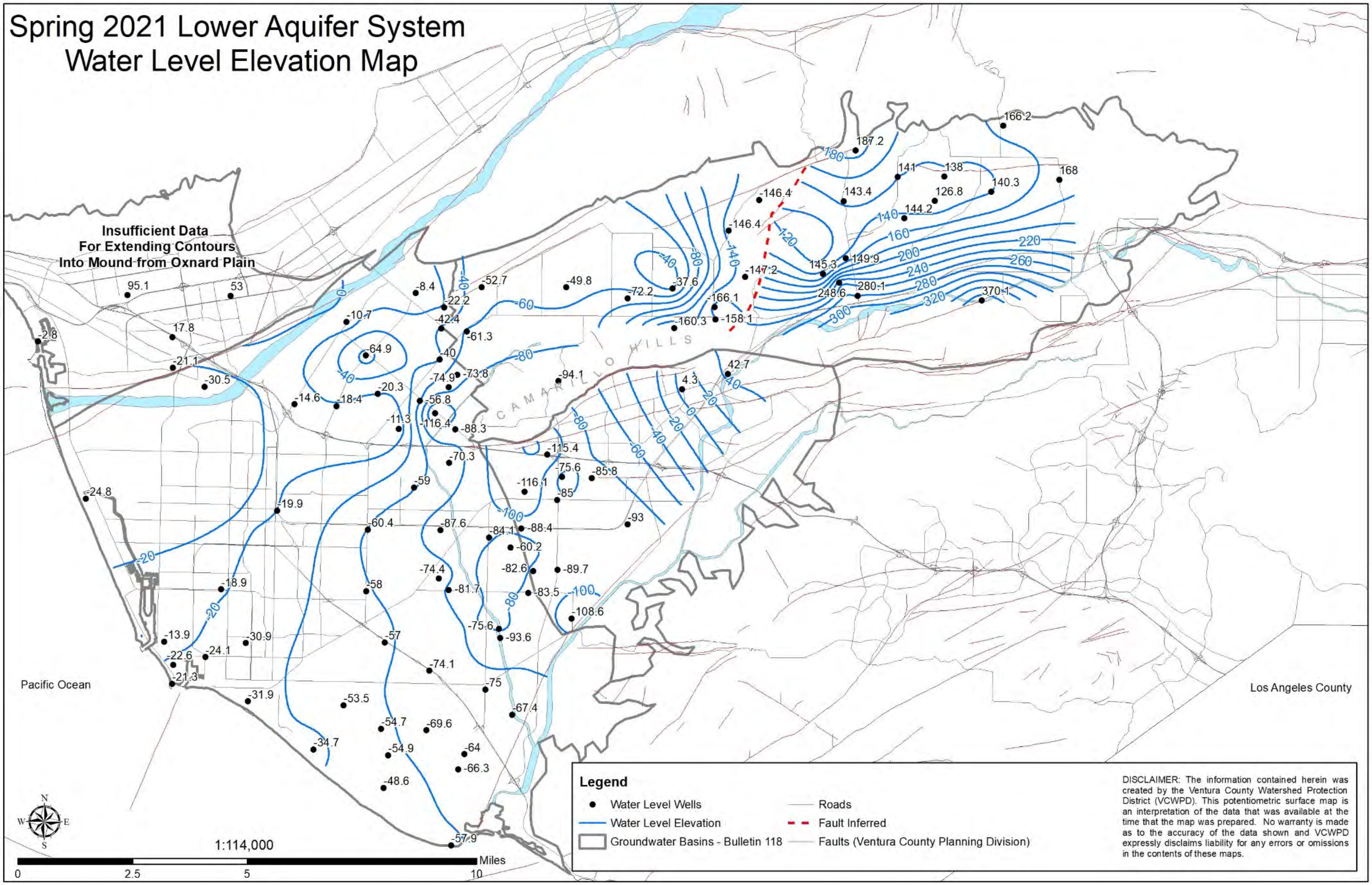


Figure 6-9: Water level surface elevation contours for the Lower Aquifer System for spring 2021.

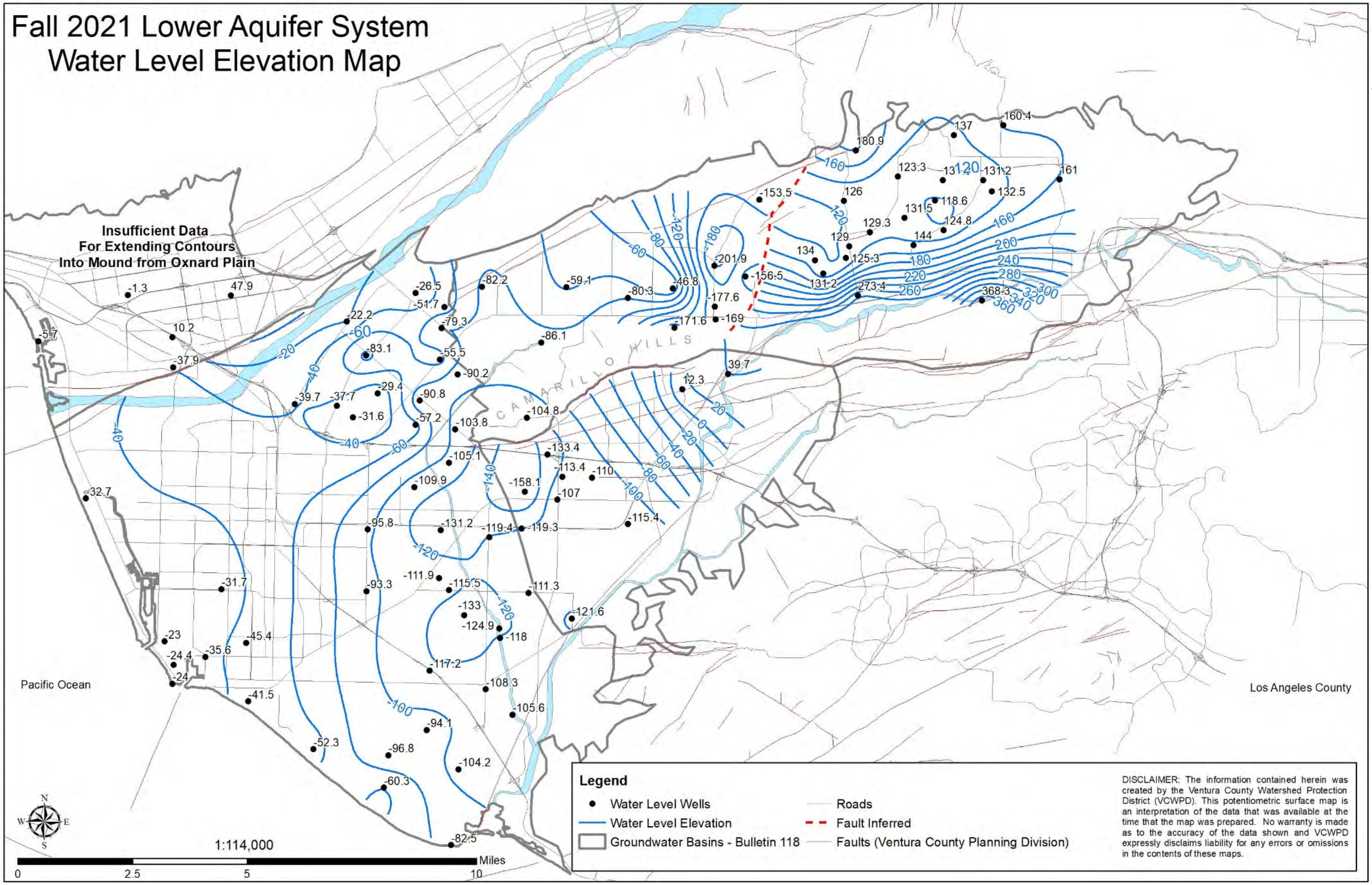


Figure 656-10: Water level surface elevation contours for the Lower Aquifer System for fall 2021.

California Statewide Elevation Monitoring Program (CASGEM)

The CASGEM Program was developed by the DWR in response to the passing of Senate Bill X7 6 and Assembly Bill 1152 in November 2009. The law directs that groundwater elevations in all basins and subbasins in California be regularly and systematically monitored, preferably by local entities, with the goal of reporting seasonal and long-term trends in groundwater elevations. Resulting information available to the public from DWR. The CASGEM program established a permanent, locally-managed system to monitor groundwater elevation in California's alluvial groundwater basins and subbasins identified in DWR Bulletin No. 118. The CASGEM program relies and builds on locally established, long-term groundwater monitoring and management programs.

VCWPD acts as the Umbrella Monitoring Entity for Ventura County by coordinating and reporting groundwater elevation data collected by multiple agencies within a basin. The Groundwater Section staff collect groundwater level data quarterly or semi-annually, depending on location. Water level data is compiled and uploaded to the CASGEM website.

CASGEM reporting is being replaced by reporting to the Sustainable Groundwater Management Act reporting portal for those basins that require a Groundwater Sustainability Agency (GSA) and Groundwater Sustainability Plan (GSP). As GSA's adopt GSP's their reporting is moved from CASGEM to the SGMA portal. There is no one umbrella monitoring entity for the SGMA portal. Individual GSA's are responsible for data reporting. The County will remain the reporting entity for those basins that remain in the CASGEM system. As of the end of 2021 reporting for Oxnard, Pleasant Valley and Las Posas basins has been moved from CASGEM to the SGMA portal.

7.0 Water Supplies

Groundwater Extractions

There are approximately 3,500 active wells in the County that extract groundwater for agricultural, domestic, municipal and industrial uses. Three groundwater management agencies (GMAs) (FCGMA, OBGMA, and UWCD) in Ventura County oversee groundwater extractions within their statutory boundaries (**Figure 7-1**).

Of the total active wells in the County, approximately 2,000 are within one or more of these agency boundaries. Owners and operators within the boundaries of a GMA are required to report groundwater extractions to their respective agency. Owners outside of a groundwater management agency boundary are not required to report extractions but are asked to report well statuses to the County through an *Annual Water Well Usage Statement*.

The FCGMA reports that approximately 60% of groundwater extracted within the Agency is used for agricultural purposes with the remaining 40% for municipal, industrial and domestic uses. **Table 7-1** compares extractions reported to the three agencies for the years 2012 through 2021. Wells located in overlapping agency boundaries must report their extractions to two agencies. This leads to uncertainty in the total volume of groundwater extracted in the County because the reported extractions cannot be combined. **Figure 7-1** shows the overlap area of the FCGMA and UWCD.

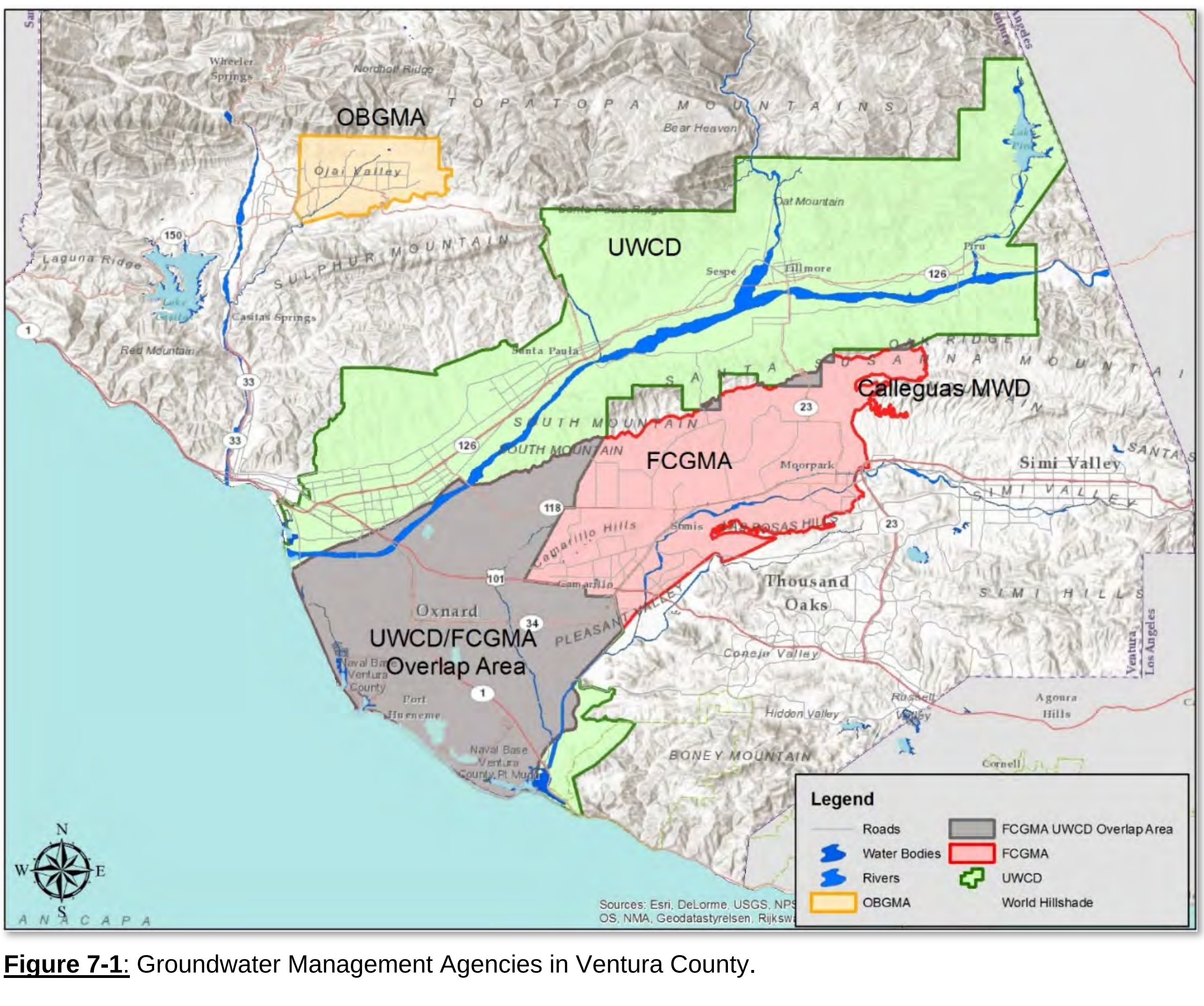


Figure 7-1: Groundwater Management Agencies in Ventura County.

Table 7-1: Groundwater extractions within reporting agencies 2012 through 2021[8,9,12]

	Agency		
Reported Extractions (AF)	UWCD	FCGMA	OBGMA
2012-1	78,716.61	59,904.02	2,845.56
2012-2	99,285.26	75,327.91	2,559.40
Annual Total 2012	**178,001.87**	**135,231.94**	**5,404.96**
2013-1	87,336.86	64,751.13	2,805.76
2013-2	116,708.94	88,957.84	2663.216
Annual Total 2013	**204,045.80**	**153,708.97**	**5,468.97**
2014-1	101,577.29	85,233.43	2,232.15
2014-2	101,468.80	65,731.43	2,144.20
Annual Total 2014	**203,046.09**	**150,964.86**	**4,376.35**
2015-1	85,905.46	71,411.15	1,817.92
2015-2	107,590.82	70,810.82	1,901.51
Annual Total 2015	**193,496.28**	**142,221.97**	**3,719.43**
2016-1	82,315.09	69,823.38	1,461.22
2016-2	100,801.24	64,323.08	1,424.93
Annual Total 2016	**183,116.33**	**134,146.46**	**2,886.15**
2017-1	69,854.68	58,467.95	1,659.09
2017-2	113,402.30	72,062.56	2,855.32
Annual Total 2017	**183,256.98**	**130,530.51**	**4,514.41**
2018-1	75,041.90	64,063.56	
2018-2	94,195.78	62,312.00	
Annual Total 2018	**169,237.68**	**123,419.79**	**4,224.03**
2019-1	57,335.53	51,722.44	
2019-2	91,649.71	61,986.53	
Annual Total 2019	**148,985.24**	**113,708.97**	**4,465.95**
2020-1	65,245.38	55,940.66	
2020-2	99,735.12	41,965.62	
Annual Total 2020	**164,980.50**	**97,906.27**	**4,637.82**
2021-1**	84,034.86	63,307.32	2,024.97
2021-2**	92,151.60	57,112.92	1,455.68
Annual Total 2021**	**176,186.46**	**120,420.24**	**3,480.65**
UWCD as 06/28/2022		FCGMA as of 08/17/2022	

**Values are subject to change. For the most up to date data please contact the respective agency.

Wholesale Districts

Surface and imported water is supplied by three wholesale water districts in the County (**Figure 7-2**):

1. Casitas Municipal Water District (Casitas),
2. Calleguas Municipal Water District (Calleguas), and
3. United Water Conservation District (UWCD).

[8] Data courtesy of FCGMA.
[9] Data courtesy of OBGMA.

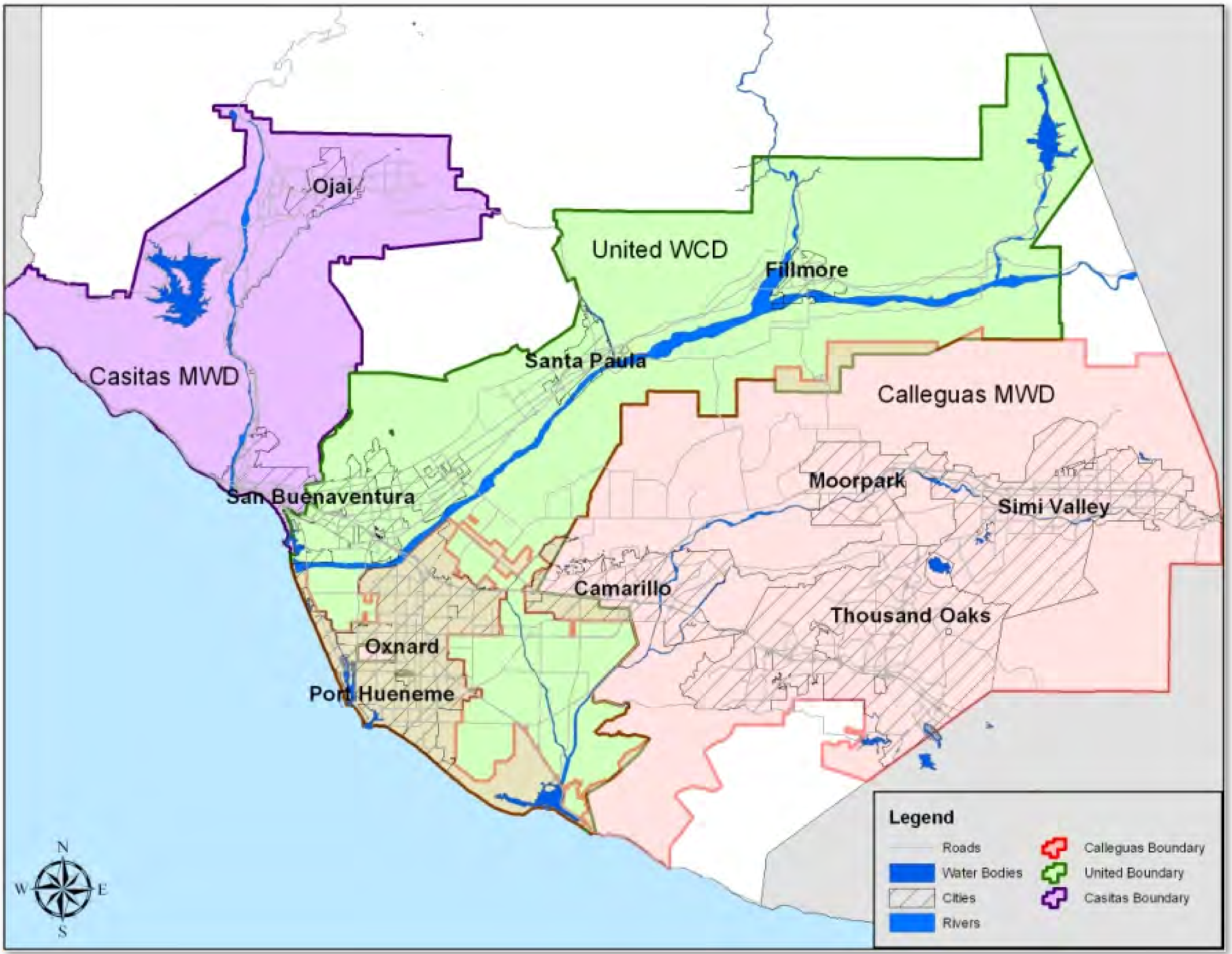


Figure 7-2: Wholesale Water District Boundary Map.

Calleguas delivers the largest volume of water to retailers. Approximately 75% of the population in the County receives a mix of imported State Water Project (SWP) water and Colorado River water from Calleguas. Water from the SWP comes from Northern California by way of an extensive water system owned and operated by the Metropolitan Water District (MWD) of Southern California, a regional wholesaler. MWD supplies imported water to Calleguas. Calleguas imported a total of 95,059.3 AF of treated water in 2021. Calleguas delivered 92,922.5 AF of water to retailers in 2021 compared to 89,631.5.10 AF in 2021. Production from the District's Aquifer Storage and Recovery (ASR) wellfield was 1,141.5 AF in 2021. Some imported water is also injected in the East Las Posas Management Area through the Las Posas (ASR) Project. In the ASR wellfield 3,457.07 AF of water was injected in 2021. Up to 11,000 AF of water can be stored by Calleguas in Lake Bard and supply the District's needs for short periods of time. The end of year water volume in storage in Lake Bard was 10,250 AF[10]. The Las Posas Basin ASR wellfield currently has 18 wells, operated by Calleguas. The wells are 800 to 1,200 feet deep and perforate the Fox Canyon Aquifer (Calleguas 2007).

UWCD delivered 20,834 AF of water to retailers and end-users in 2021, down from 22,635 AF in 2020. UWCD can store up to 87,000 AF of water in Lake Piru. At the end of 2021 there was 18,074 AF of stored water in Lake Piru. UWCD released 5,526 *(preliminary data)* AF of water from the lake in 2021. UWCD

[10] Data provided courtesy of Calleguas MWD.

imported 3,782 AF of SWP water into Ventura County from Pyramid Lake in 2021. Water released from Lake Piru flows down Piru Creek to the Santa Clara River where it is ultimately diverted downstream at the Freeman Diversion Dam. UWCD operates spreading basins in the Oxnard Basin Forebay Management Area for the purpose of groundwater recharge. Some of the water diverted from the Santa Clara River at the Freeman Diversion is sent to the Forebay spreading basins in Saticoy and El Rio, the remainder is sent through the Pleasant Valley Pipeline (PVP) and the Pumping Trough Pipeline (PTP). **Table 7-2** and **Figure 7-4** compare the volume of water diverted and sent to spreading grounds by UWCD[11]. Annual precipitation for the period of 2012 to 2021 is also shown, however recharge to basins is a function of SWP deliveries and restrictions from other agencies.

Table 6-2: Comparison of precipitation versus recharge water volume by Calendar Year for UWCD.

CY Year	Precipitation El Rio Spreading Grounds Gage 239(in.)	Saticoy Recharge (AF)	El Rio Recharge (AF)	Noble Pit (AF)
2012	8.79	3,985	16,293	538
2013	2.97	34	2,389	263
2014	9.50	387	1,935	578
2015	5.09	1,231	1,285	0
2016	10.00	1,784	806	59
2017	15.22	3,100	6,043	1,036
2018	9.52	2,301	1,205	212
2019	23.71	16,121	20,976	3,008
2020	6.96	8,847	22,075	0
2021	12.35	4,175	7,118	0

[11] Data provided courtesy of UWCD is preliminary and subject to change per UWCD. Freeman Diversion data from UWCD operations logs.

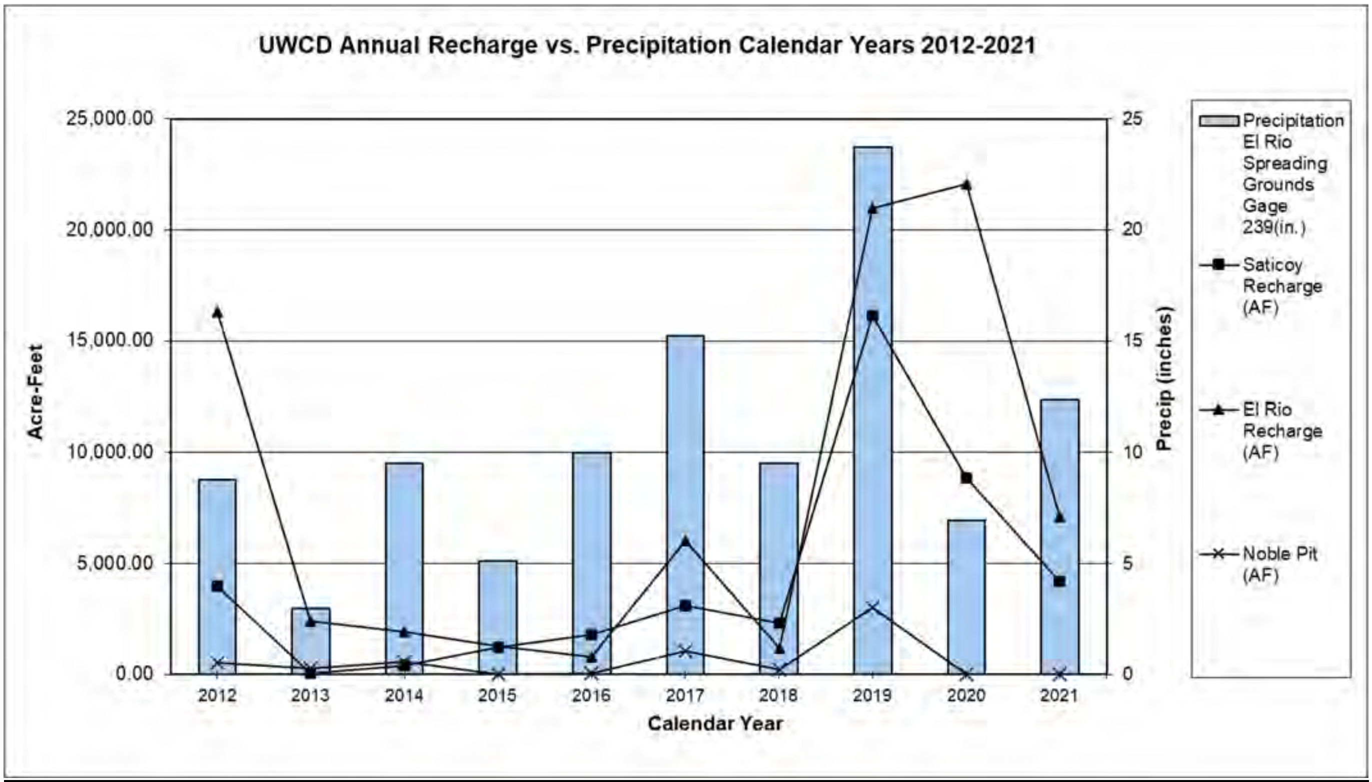


Figure 7-3: Graph depicting precipitation versus recharge for UWCD 2012-2021.

Casitas delivered approximately 13,233 AF in 2021 up from 11,842 AF in 2020, with 4,570.7 AF sold to retail water purveyors. The district provides water to residential and agricultural customers, and some of the 23 water purveyors located within the district's boundaries. Annual water deliveries can vary from 8,000 to 23,000 AF. Casitas provides a blend of groundwater and surface water to its customers. Surface water is stored in Lake Casitas which has an overall capacity of 238,000 AF. At the end of 2021, 81,684 AF of water was stored in the lake. Water from the Ventura River is diverted at the Robles Diversion facility. The facility diverts high flows from rainstorms and operates on average only 53 days per year. Casitas diverts, on average 31% of the Ventura River flow, with 10% of that volume being redirected downstream through the Robles Diversion Fish Passage for the endangered steelhead trout and to enhance recovery of the Ventura River habitat[12].

[12] Data provided courtesy of Casitas MWD.

Table 7-3: Comparison of wholesale district water deliveries 2012-2021.

	Total Water Deliveries in Acre Feet (AF)			
Year	**Casitas MWD**	**Calleguas MWD**	**United WCD**	**Annual Total**
2012	15,268	104,104	32,638	152,010
2013	18,270	111,283	24,358	153,911
2014	18,336	106,293	17,492	142,121
2015	16,272	89,045	16,293	121,609
2016	12,793	87,542	16,757	117,092
2017	12,166	89,666	16,613	118,445
2018	12,168	91,340	16,953	120,461
2019	8,490	82,237	16,689	107,416
2020	11,842	89,632	21,048	122,522
2021	13,233	92,923	20,834	126,990
Period Total	**138,838**	**944,064**	**199,675**	**1,282,577**

Surface Water

Surface water resources can be hydrologically linked to groundwater resources. The connection between surface water and groundwater is understood by natural recharge of aquifers from surface water (losing streams), and discharge of groundwater to surface water (gaining streams). Surface water diversions allow for use of surface water instead of extracted groundwater. Surface water is used to artificially recharge groundwater.

Figure 6-4 shows the volume of stored surface water and diverted surface water. In 2021, UWCD released approximately 5,526 AF of water from Lake Piru, including a fish passage requirement of 5 cubic feet per second (cfs) per day. UWCD diverted 13,989 AF from the Santa Clara River at the Freeman Diversion Dam with 4,175 AF sent to the Saticoy Spreading Grounds, 7,118 AF sent to the El Rio Spreading Grounds and 0 AF sent to the Noble Pit, with some surface water also going to agricultural customers through the PTP and the PVP. At the end of 2021 there was 18,074 AF of water in storage in Lake Piru, 81,684 AF in Lake Casitas and 10,250 AF in Lake Bard. Casitas releases 3,200 AF per year from Lake Casitas for the Robles Diversion Fish Passage.

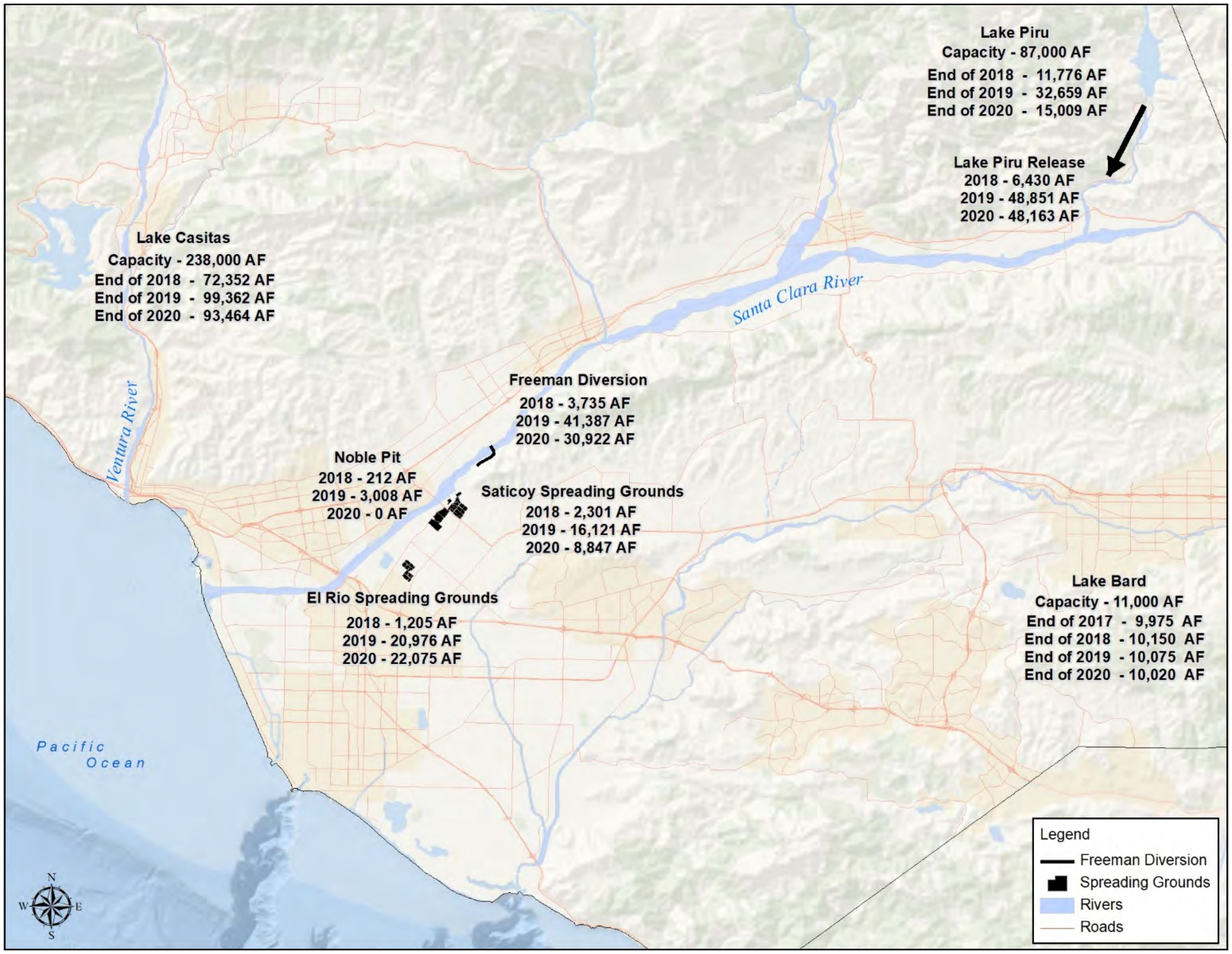


Figure 7-4: Surface water storage and diversion map[11, 12, 13].

Surface & Imported Water Demands

Of the ten incorporated cities within Ventura County only Santa Paula and Fillmore do not rely on water supplied by the three major wholesale districts.

The cities of Ventura and Oxnard use a blend of imported water, groundwater and treated surface water to meet demands. The City of Ventura's water supply comes from treated water diverted from the Ventura River, groundwater extracted from City wells and surface water from Lake Casitas delivered by Casitas. The City of Oxnard receives water from UWCD, imported water from Calleguas Municipal Water District and groundwater from City well fields.

In the southern half of the County, the cities of Simi Valley, Moorpark and Thousand Oaks as well as the communities of Bell Canyon, Newbury Park, Hidden Valley, Lake Sherwood, Oak Park and part of Westlake Village rely mainly on water imported from Calleguas.

The City of Simi Valley receives water from Ventura County Water Works District No. 8 (VCWWD8). VCWWD8 extracts groundwater from three wells in the Tapo Canyon area. Groundwater is also extracted from several dewatering wells at the west end of the city which is discharged to the Arroyo Simi. The Tapo Canyon Water Treatment Plant, a one-million gallon per day (MGD) facility, utilizes the three Tapo Canyon wells to provide water to approximately 500 homes. Golden State Water Company (GSWC) in Simi Valley extracts groundwater from one well and blends it with imported water from Calleguas (10% groundwater, 90% imported water)[13]. VCWWD8 serves 68% of demand or approximately 23,000 AF of water while GSWC serves the remaining 32%, approximately 8,500 AF[14]. In 2021 Calleguas delivered 19,872 AF to VCWWD8 and 5,272 AF to GSWC.

The City of Moorpark residents receive water from Ventura County Water Works District No. 1 (VCWWD1). Approximately 75-80% of VCWWD1's water is imported from Calleguas. In 2021, Calleguas delivered 7,618 AF to VCWWD1. The City also extracts groundwater from two wells used for park irrigation.

The City of Thousand Oaks extracts groundwater using it for median irrigation on Hillcrest Ave. and golf course irrigation at the Los Robles Golf Course. California Water Service and California American Water along with the City of Thousand Oaks Water Department provide water imported from Calleguas in the Thousand Oaks, Newbury Park and Westlake Village area. According to the *City of Thousand Oaks 2015 Urban Water Management Plan*, the City supplies water to approximately 36% of water users, California American Water 48%, and California Water Service Company 16%. In 2021, these three water purveyors received 32,709 AF of water from Calleguas.

The City of Camarillo relies on groundwater and imported water from Calleguas. The city extracts groundwater from four wells, supplying approximately 40-50% of the city's water demand with the remaining demand supplied by imported water. The city must keep its groundwater extraction volume below the groundwater extraction allocation from the FCGMA. In 2021, Calleguas delivered 5,971 AF of water to the City of Camarillo. Water for some residents is supplied by Pleasant Valley Mutual (groundwater and imported water), Crestview Mutual (groundwater and imported water), California American Water Co. (imported water), and Camrosa Water District (groundwater and imported water).

The Port Hueneme Water Agency receives and treats water from UWCD and blends it with water from Calleguas for the City of Port Hueneme, Channel Islands Beach Services Community District and Naval Base Ventura County.

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[13] Golden State Water Company, 2015 Urban Water Management Plan – Simi Valley.

[14] Ventura County Waterworks District No. 8, City of Simi Valley, 2015 Urban Water Management Plan.

In the Ojai Valley, the City of Ojai and the communities of Casitas Springs, Meiners Oaks and Oak View rely on a mixture of groundwater extracted by local purveyors, and wholesale water from Lake Casitas delivered by Casitas Municipal Water District to local water purveyors.

In the Santa Clara River Valley area, the City of Santa Paula relies on local groundwater (approximately 5,000 to 7,000 AF/yr based on reporting to UWCD). In addition, some surface water is diverted from Santa Paula Creek (approximately 500 AF/yr)[15] and is sent to Canyon Irrigation Company in exchange for extraction credits for the Santa Paula Basin. The City of Fillmore relies solely on groundwater extracted from City water wells (approximately 2,600 to 2,800 AF/yr based on reporting to UWCD). The community of Piru relies on groundwater delivered by local water purveyors.

Residents of the Lockwood Valley area and the Santa Monica Mountains area, as well as residents living in areas not served by a water company rely on private domestic water wells. Water is extracted from groundwater basins, or from water-bearing units (fractured volcanic rock and bedrock) in areas outside of groundwater basins.

[15] Data from City of Santa Paula 2015 Urban Water Management Plan

8.0 Sustainable Groundwater Management Act (SGMA)

On January 1, 2015, the Sustainable Groundwater Management Act (SGMA) became effective. SGMA is a comprehensive three-bill package that establishes a new structure for local authorities to sustainably manage their groundwater basins. Sustainable management under the act is defined as the management and use of groundwater in a manner that can be maintained without causing "significant and unreasonable" impacts to one or more of the following indicators: (1) lowering of groundwater levels, (2) reduction of groundwater storage, (3) seawater intrusion, (4) water quality degradation, (5) land subsidence, and (6) impacts on beneficial uses of interconnected surface water.

SGMA requires the formation of local groundwater sustainability agencies (GSAs) in all DWR Bulletin No. 118 basins designated as high or medium priority and critically-overdrafted. GSAs can form in low-priority basins, but the law does not require it. GSAs must assess conditions in their respective water basins and adopt a groundwater sustainability plan (GSP) that ensures the basin will be sustainably managed within 20 years, with interim milestones subject to state review every five years. Critically overdrafted basins must submit a GSP by January 31, 2020; other high and medium priority basins must be managed under a GSP by January 31, 2022.

Critically Overdrafted Basins

SGMA states a basin is subject to critical overdraft "when continuation of present water management practices would probably result in significant adverse overdraft-related environmental, social, or economic impacts." Undesirable impacts result from conditions of critical overdraft which include seawater intrusion, land subsidence, groundwater depletion, and/or lowering of groundwater levels. SGMA directed the DWR to identify critically overdrafted groundwater basins and subbasins. DWR identified a statewide base period from 1989 to 2009 for evaluation that included wet and dry periods. A basin is placed in critical overdraft when the basin has one or more undesirable impacts. DWR compiled a list of 21 critically overdrafted basins and subbasins in January 2016. Three are in Ventura County (**Figure 8-1**). Those basins are the Cuyama Valley Basin (Bulletin 118 No. 3-013), the Pleasant Valley Basin (Bulletin 118 No. 4-006), and the Oxnard Subbasin (Bulletin 118 No. 4-004.02).

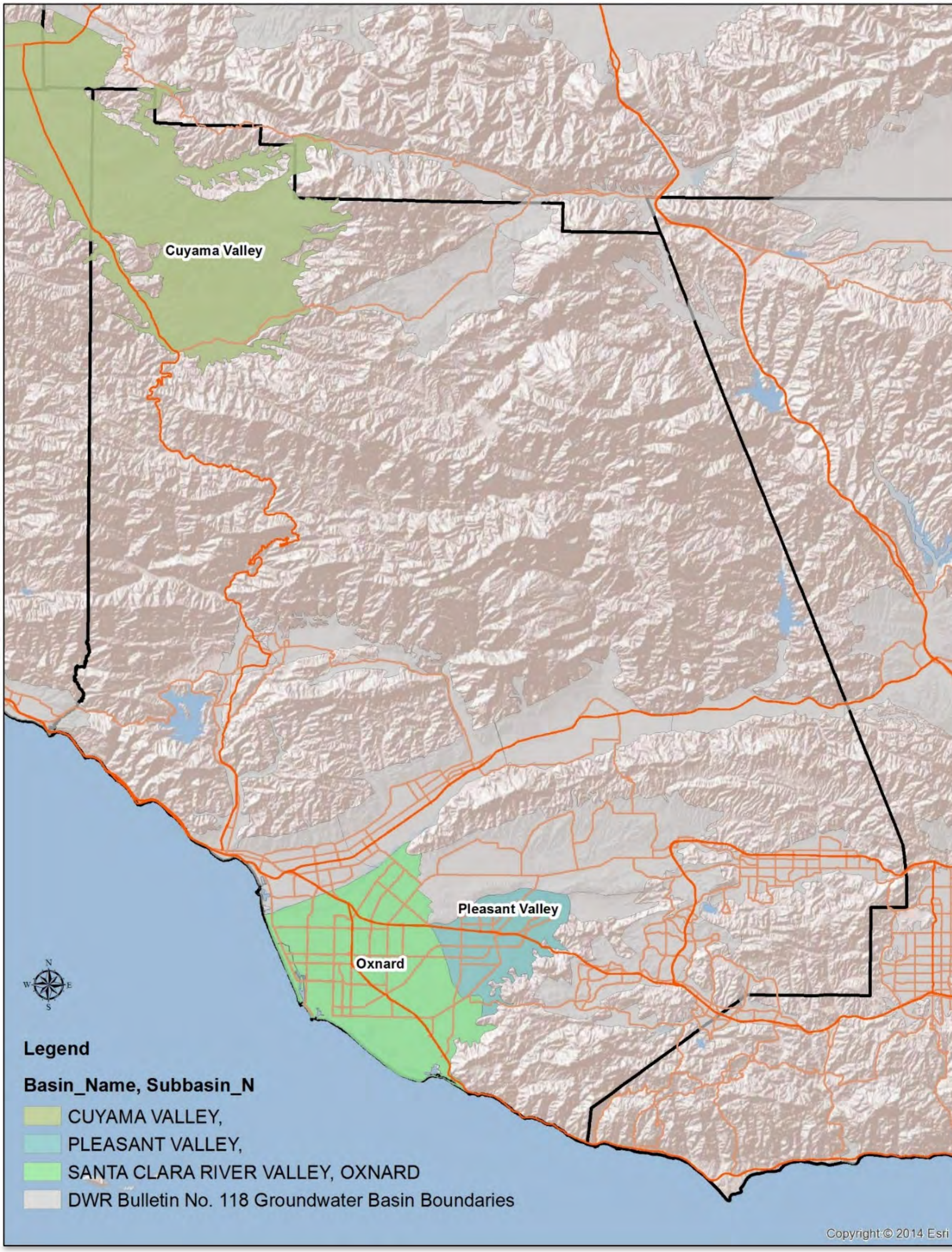

Figure 8-1: Critically overdrafted basins in Ventura County.

High & Medium Priority Basins in Ventura County

DWR's Basin Prioritization is a technical process that utilizes the best available data and information to classify California's 515 groundwater basins into one of four categories: high-, medium-, low-, or very-low priority. Each basin's priority determines which provisions of California Statewide Groundwater Elevation Monitoring (CASGEM) and SGMA apply. SGMA requires medium- and high-priority basins to develop GSAs, develop GSPs and manage groundwater for long-term sustainability.

As of May 2014, 127 of the 517 basins were ranked as medium and high priority basins. Those 127 medium and high priority basins account for 96% of California's annual groundwater extraction. Ventura County has a total of four high priority and seven medium priority basins (**Figure 8-2**).

New priority rankings were completed by DWR in late 2019.

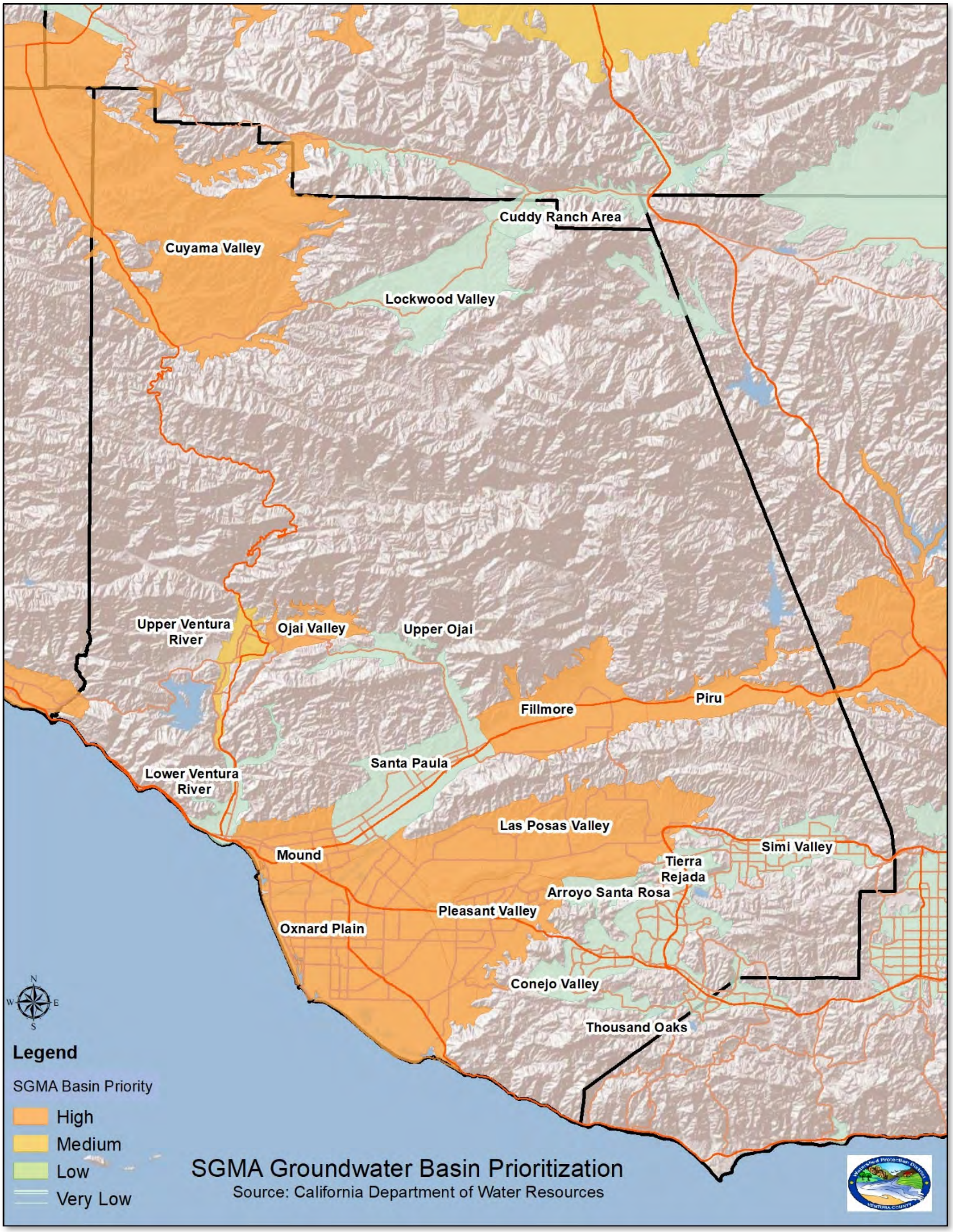

Figure 8-2: 2019 Final SGMA B118 basin prioritization.

Adjudicated Basins

Santa Paula Basin

The Santa Paula Basin (Bulletin 118 Basin No. 4-004.04) is currently the only adjudicated basin in Ventura County. Adjudicated basins do not need a GSA but must still provide groundwater measurements to DWR.

Santa Paula Basin's groundwater rights were adjudicated in 1996 in a stipulated judgement to establish pumping allocations and a management plan for the basin. The judgment awarded 27,500 acre-feet of groundwater rights to the SPBPA to be held in trust for the benefit of its members. Each member is entitled to an "Individual Party Allocation" (IPA) that establishes a maximum quantity of water that can be extracted from the basin. The judgment also includes cut back provisions that can be implemented as necessary to balance total production within the basin's safe yield.

A Watermaster is usually appointed by the court to ensure the basin is managed in accordance with the court's decree. A Technical Advisory Committee (TAC) acts as the Watermaster for the Santa Paula Basin with equal representation from UWCD, the SPBPA and the City of San Buenaventura. The TAC also determines the safe yield of the basin, along with the development and implementation of a basin management plan. Annual reports of the monitoring program are submitted to the TAC for review and approval. The primary groundwater management objective in the Santa Paula Basin is to ensure that production does not exceed the long-term sustainable yield of quality groundwater for current and future uses.

Groundwater Sustainability Agencies (GSAs)

GSAs are responsible for developing and implementing a GSP to ensure the basin meets its sustainability goal by operating within its sustainable yield without creating undesirable results. Before DWR will accept and review submitted GSPs, a basin must be managed under a GSA or multiple GSAs. GSAs for all medium- and high-priority basins in Ventura County have been formed and there are no “unmanaged areas.[16]” Below are all GSA’s in Ventura County.

Arroyo Santa Rosa Basin GSA

The County of Ventura and the Camrosa Water District (Camrosa) entered into a Joint Exercise of Powers Agreement (JPA) to manage the portion of the Arroyo Santa Rosa Basin (Bulletin 118 Basin No. 4-07) outside of the FCGMA boundary. The JPA was approved by the Ventura County Board of Supervisors on October 4, 2016, officially forming the Arroyo Santa Rosa Basin GSA. The western area of the Arroyo Santa Rosa Basin is managed by the FCGMA and the eastern portion by the Arroyo Santa Rosa Basin GSA.

Camrosa Las Posas Basin GSA

The majority of the Las Posas Basin fall under the jurisdiction of the FCGMA. However, a 4.5-mile section along the southern border is outside of the FCGMA boundaries. The section outside of the boundary will be managed by Camrosa. Camrosa delivers potable and non-potable water to residential and agricultural customers in that area and filed to act as the GSA for that portion of the basin on June 28, 2017.

Camrosa OPV Management Area GSA

Camrosa also filed to act as the GSA for the portions of the Oxnard Subbasin and Pleasant Valley Basin outside of the FCGMA boundary on June 28, 2017. Camrosa will be the GSA for areas that lie within their service area but are outside of the FCGMA boundaries. The Subbasin and Basin were identified as high priority in 2014 through the CASGEM prioritization process.

Cuyama Basin GSA (CBGSA)

The Cuyama Basin underlies portions of three counties, Santa Barbara County, Kern County and Ventura County. On June 12, 2017, the CBGSA posted notice to act as the GSA for the entire basin. The CBGSA is a joint powers authority comprised of six local agencies: the Cuyama Basin Water District, Cuyama Community Services District, Santa Barbara County Water Agency, San Luis Obispo County, Ventura County and Kern County. These six agencies collectively carry water management, water supply, and land use responsibilities across the entire basin.

Fillmore and Piru Basins GSA

The Fillmore and Piru Subbasins lie along the Santa Clara River in the eastern portion of Ventura County. On June 28, 2017, the Fillmore and Piru Basins GSA posted notice to act as the GSA for both basins. The Fillmore and Piru Basins GSA is a joint powers authority comprised of UWCD, Ventura County and the City of Fillmore. UWCD is authorized to conduct water resource investigations, acquire water rights, build water storage and recharge facilities, construct wells and pipelines for water deliveries, commence actions involving water rights and water use, and prevent interference with or diminution of stream/river flows. The County exercises water management and land use authority throughout the county, including the Fillmore and Piru Basins. The City of Fillmore is a local municipality that exercises water supply, water management and land use authority within the city's boundaries.

Mound Basin GSA (MBGSA)

The MBGSA posted notice with the DWR on June 29, 2017, to be the GSA for the Mound Subbasin (DWR Basin No. 4-004.03). MBGSA is a joint powers authority comprised of three local public agencies: the City

[16] Unmanaged areas are areas in high or medium priority basins in which a local agency has not filed to become a GSA and are not within the service area of another GSA.

of Ventura, Ventura County, and UWCD. The City of Ventura exercises water supply, water management and land use authority within its boundaries. The County exercises water management and land use authority in land overlying the Mound Subbasin. UWCD is authorized to replenish groundwater of the basin and does not extract groundwater.

Fox Canyon Groundwater Management Agency

On February 11, 2015, the FCGMA notified the DWR of their intent to become the exclusive GSA for the Arroyo Santa Rosa Basin, Oxnard Subbasin, Pleasant Valley Basin and the Las Posas Valley Basin. The FCGMA's authority is limited to areas within the portions of the Arroyo Santa Rosa, Oxnard Subbasin, Pleasant Valley and Las Posas Valley Basins that lie within its boundary. The FCGMA is the exclusive GSA for those basins within the agency's statutory boundaries.

Ojai Basin Groundwater Management Agency (OBGMA)

The OBGMA filed a notice of intent to become the exclusive GSA for the Ojai Valley Groundwater Basin on December 6, 2014. The OBGMA submitted an analysis of their basin conditions on December 22, 2016, in lieu of preparing a GSP plan. The basin analysis is under review by the DWR and must demonstrate the basin has operated within its sustainable yield over a 10-year period.

Upper Ventura River Groundwater Agency (UVRGA)

The UVRGA filed a notice of intent to become the GSA for the Ventura River Valley Upper Basin, Ventura River Subbasin on April 21, 2017. The UVRGA is a joint powers authority comprised of five local public agencies: (1) Casitas Municipal Water District, (2) the City of Ventura, (3) Ventura County, (4) Meiners Oaks Water District, and (5) the Ventura River Water District. Prior to GSA formation, the Upper Ventura River Basin boundary was modified, reducing the area.

The County of Ventura

On June 28, 2017, the County notified DWR of their intent to become the GSA for all areas in basins outside of the management of a GSA. The notice was filed to prevent a basin from being designated as a "probationary basin" if unmanaged areas existed after June 30, 2017. There are no unmanaged areas of a basin within the County.

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Appendices

Appendix A – Glossary of Groundwater Terms

Aquifer: A geologic formation or structure that yields water in sufficient quantities to supply pumping wells or springs.

Abandoned Well: Means any of the following:

(1) A water well used less than 8 hours in any twelve-month period. Failure to submit reports of well usage will result in a well being classified as abandoned.
(2) A monitoring well from which no monitoring data has been taken for a period of two years.
(3) A well which is in such a state of disrepair that it cannot be made functional for its original use or any other use.
(4) An open engineering test hole after 24 hours has elapsed after construction and testing work has been completed on the site.
(5) A cathodic protection well which is no longer used for its intended purpose.

Confined Aquifer: An aquifer separated from the surface by an aquiclude or an aquitard to the extent that pressure can be created in the lower reaches of the aquifer.

Contamination: Alteration of waters by waste, salt-water intrusion or other materials to a degree which creates a hazard to the public health through actual or potential poisoning or through actual or potential spreading of disease.

Department of Water Resources: (DWR) operates and maintains the State Water Project, including the California Aqueduct. The department also provides dam safety and flood control services, assists local water districts in water management and conservation activities, promotes recreational opportunities, and plans for future statewide water needs.

Fox Canyon Groundwater Management Agency (FCGMA): The Agency created when the California State Legislature enacted and passed State Assembly Bill No. 2995 on Sept. 13, 1982, creating the *Fox Canyon Groundwater Management Agency (GMA)*. This law, also referred to as AB2995, granted jurisdiction over all lands overlying the Fox Canyon aquifer zone to control seawater intrusion, protect water quality, and manage water resources.

Groundwater: Water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water.

Groundwater Basin: A geologically and hydrologically defined area containing one or more aquifers, which store and transmit water yielding significant quantities of water to extraction facilities.

Lower Aquifer System (LAS): The area underlying the Oxnard Pressure Basin, which contains the Hueneme aquifer, the Fox Canyon Aquifer and the Grimes Canyon aquifer. The LAS is recharged from the Fox Canyon and Grimes Canyon Outcrops, the areas where the aquifers come to the surface exposing the permeable sands and gravels to recharge from rainfall and surface runoff.

Overdraft: The condition of a groundwater basin or aquifer where the average annual amount of water extracted exceeds the average annual supply of water to a basin or aquifer.

Perched or Semi-Perched Aquifer: The water-bearing area that is located between the earth's surface and clay deposits that exist above an Aquifer.

Receiving Waters: All waters that are "Waters of the State" within the scope of the State Water Code, including but not limited to, natural streams, creeks, rivers, reservoirs, lakes, ponds, water in vernal pools, lagoons, estuaries, bays, the Pacific Ocean, and ground water.

Seawater Intrusion: The overdrafting of aquifers, which results in, the depletion of water supplies, lowering of water levels and degradation from seawater intrusion. Seawater intrusion results from the reversal of hydrostatic pressure allowing water flow to be onshore rather than offshore.

Total Dissolved Solids: (TDS) is a term that represents the amount of all of our natural minerals that is dissolved in water.

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

United Water Conservation District (UWCD): The District administers a "basin management" program for the Santa Clara Valley and Oxnard Plain, utilizing the surface flow of the Santa Clara River and its tributaries for replenishment of groundwater. Originally established as the Santa Clara River Water Conservation District in 1927.

Upper Aquifer System (UAS): The area underlying the Oxnard Pressure Basin, which contains the perched and semi-perched zones, the Oxnard aquifer zone, and the Mugu aquifer. The UAS is recharged via the twenty-three square mile unconfined Oxnard Forebay Basin near El Rio.

Water Quality Standards: Defined as the beneficial uses (e.g., swimming, fishing, municipal drinking water supply, etc.) of water and the water quality objectives adopted by the State or the United States Environmental Protection Agency to protect those uses.

Water Well Ordinance No. 4468: The Ventura County Groundwater Conservation Ordinance which was originally adopted by the Board of Supervisors in October 1970 and revised in 1979, 1984, 1985, 1987, 1991, 1999 and most recently in December 2014. The purpose of the ordinance is to ensure that all new or modified water, cathodic protection and monitoring wells are drilled by licensed water well contractors and are properly sealed so that they cannot serve as conduits for the movement of poor quality or polluted waters into useable aquifers or be hazardous to people or animals.

Well Destruction: To fill a well (including both interior and annular spaces if the well is cased) completely in such a manner that it will not produce water or act as a conduit for the transmission of water between any water-bearing formations penetrated.

Well Owner: The owner of the land on which a well is located.

Appendix B – Key Water Level Hydrographs

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Appendix B – Key Water Level Wells

Figure B-1: Map showing key water level wells in Ventura County.

Appendix B – Key Water Level Wells

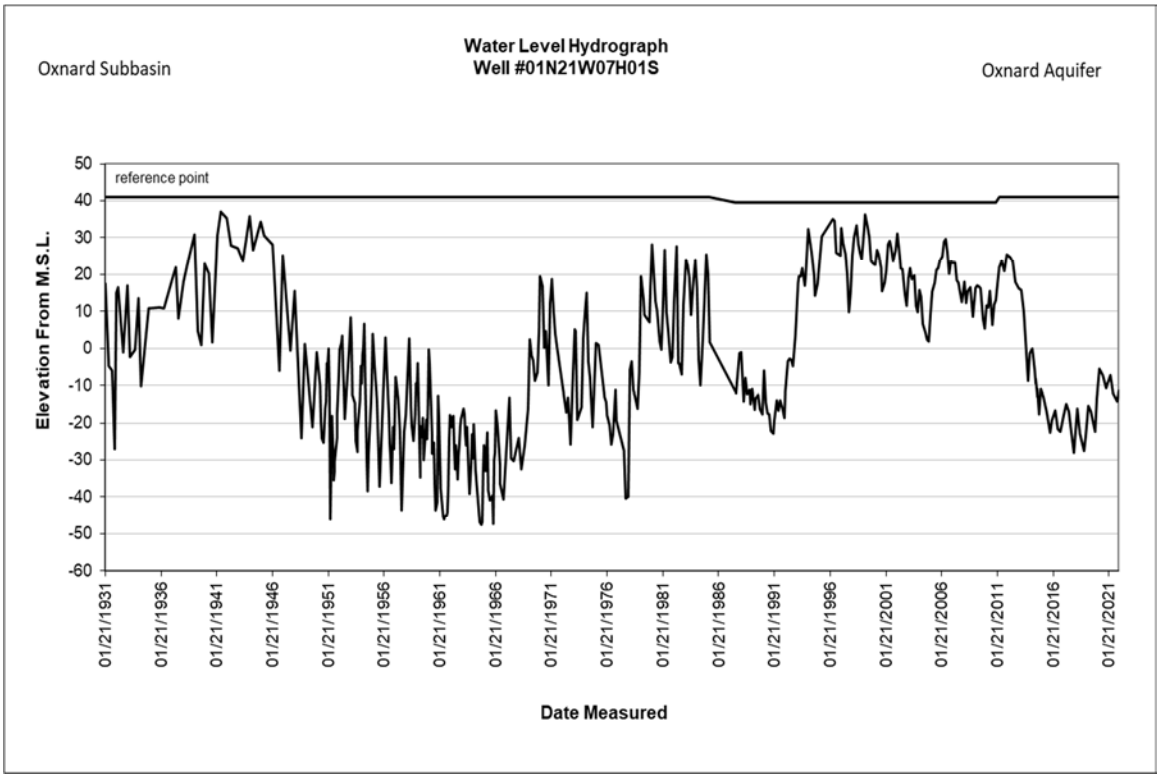

Figure B-2: Oxnard aquifer key well Hydrograph.

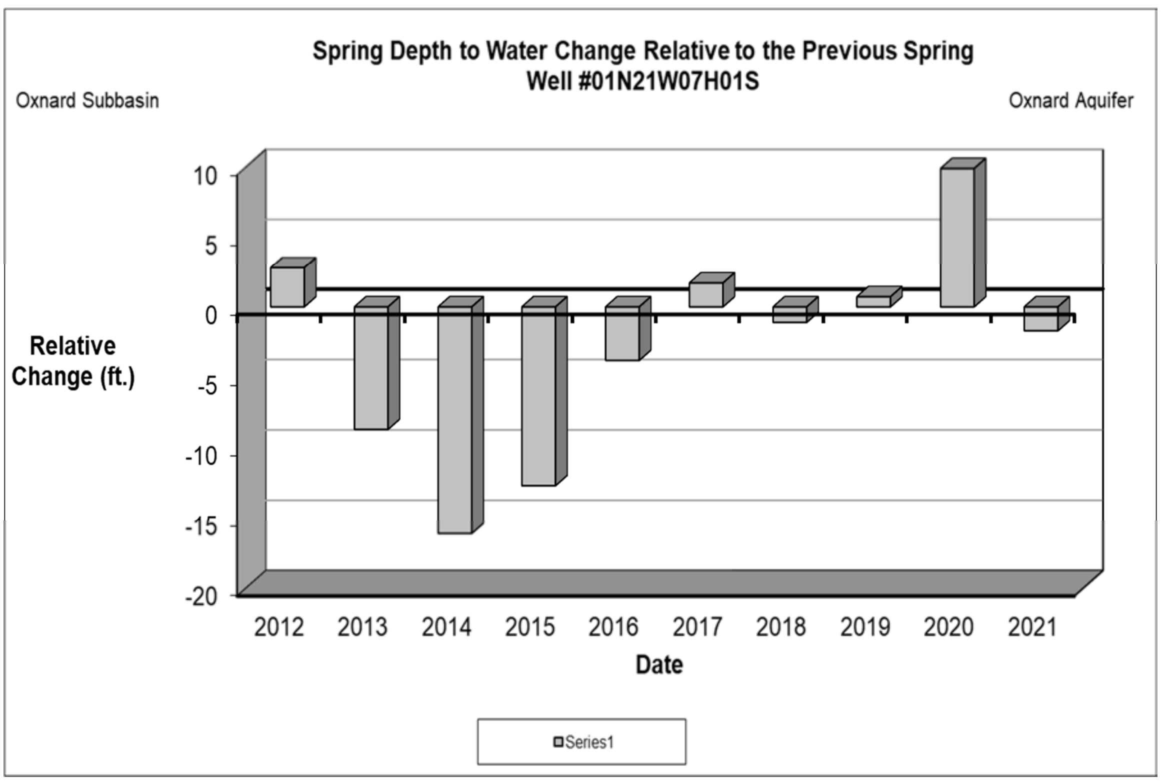

Figure B-3: Oxnard aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

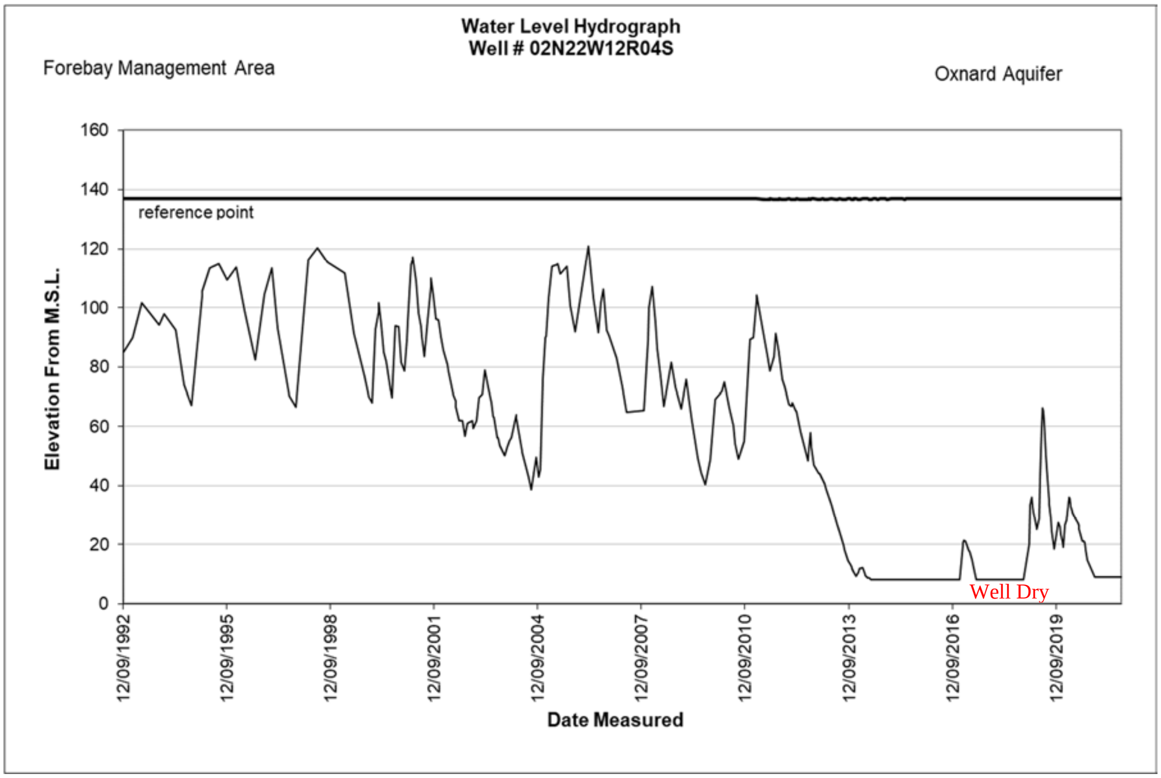

Figure B-4: Forebay Management Area key well Hydrograph.

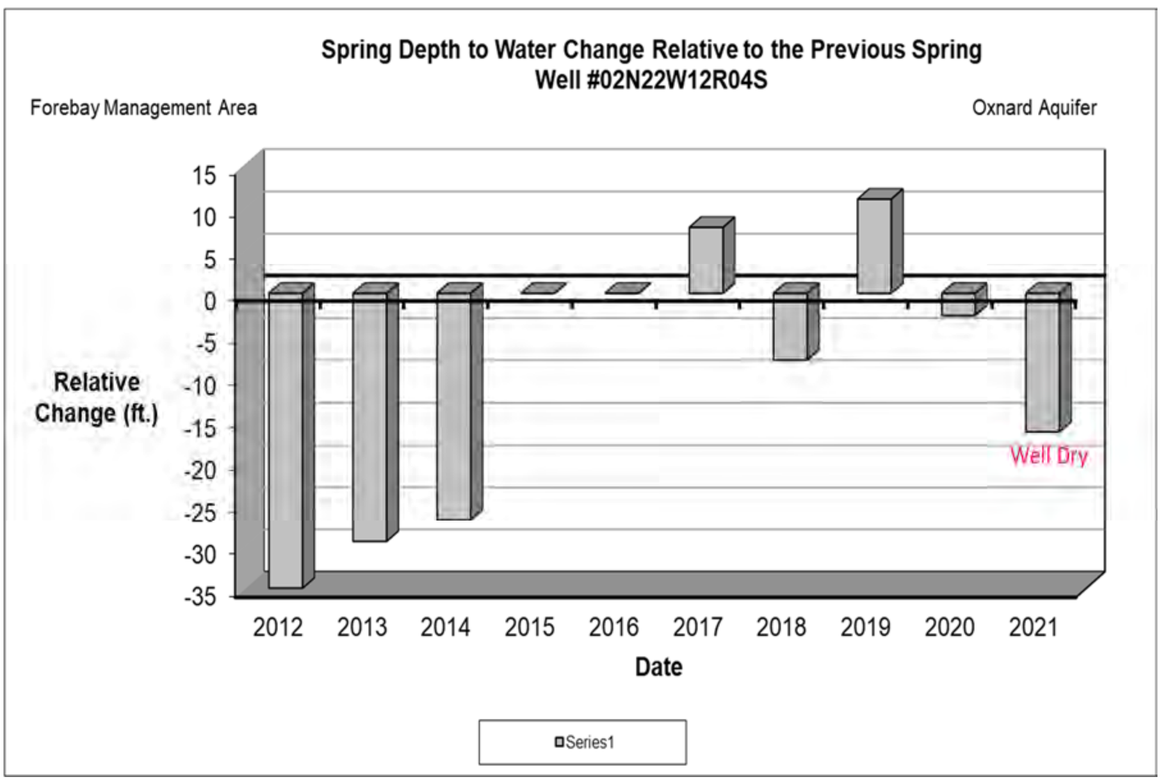

Figure B-5: Forebay Management Area 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

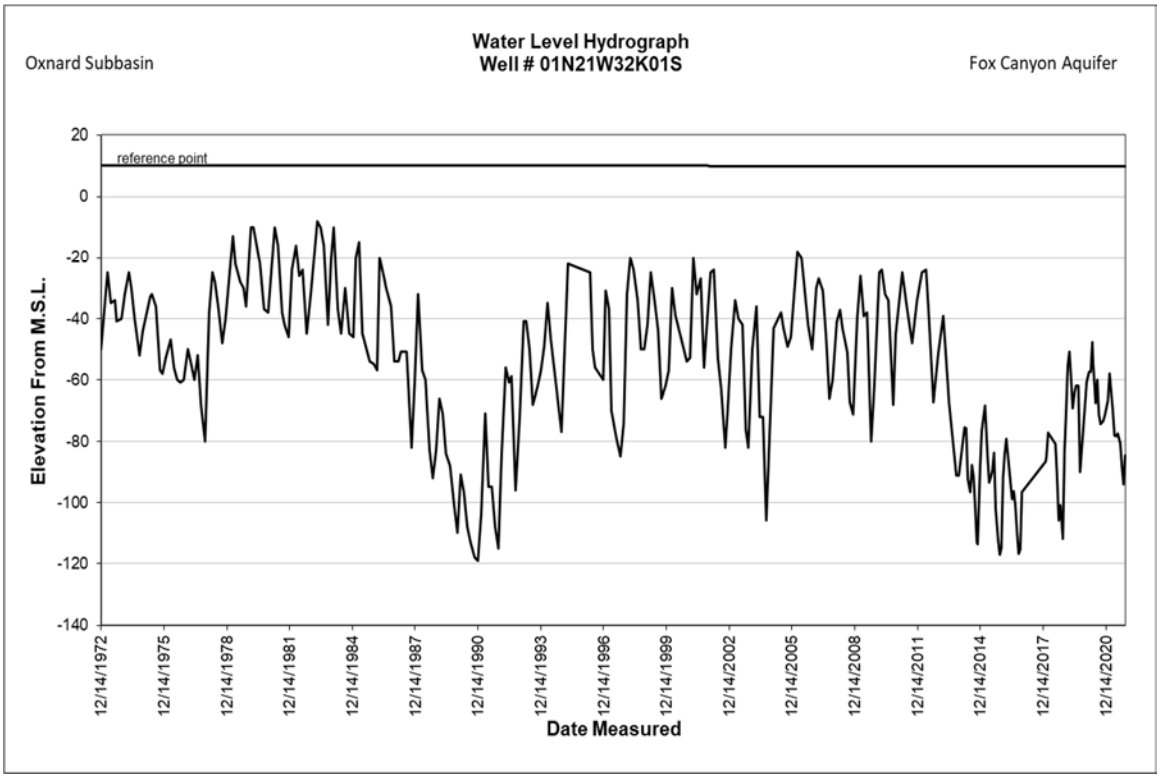

Figure B-6: Oxnard Subbasin Fox Canyon Aquifer Key Well Hydrograph.

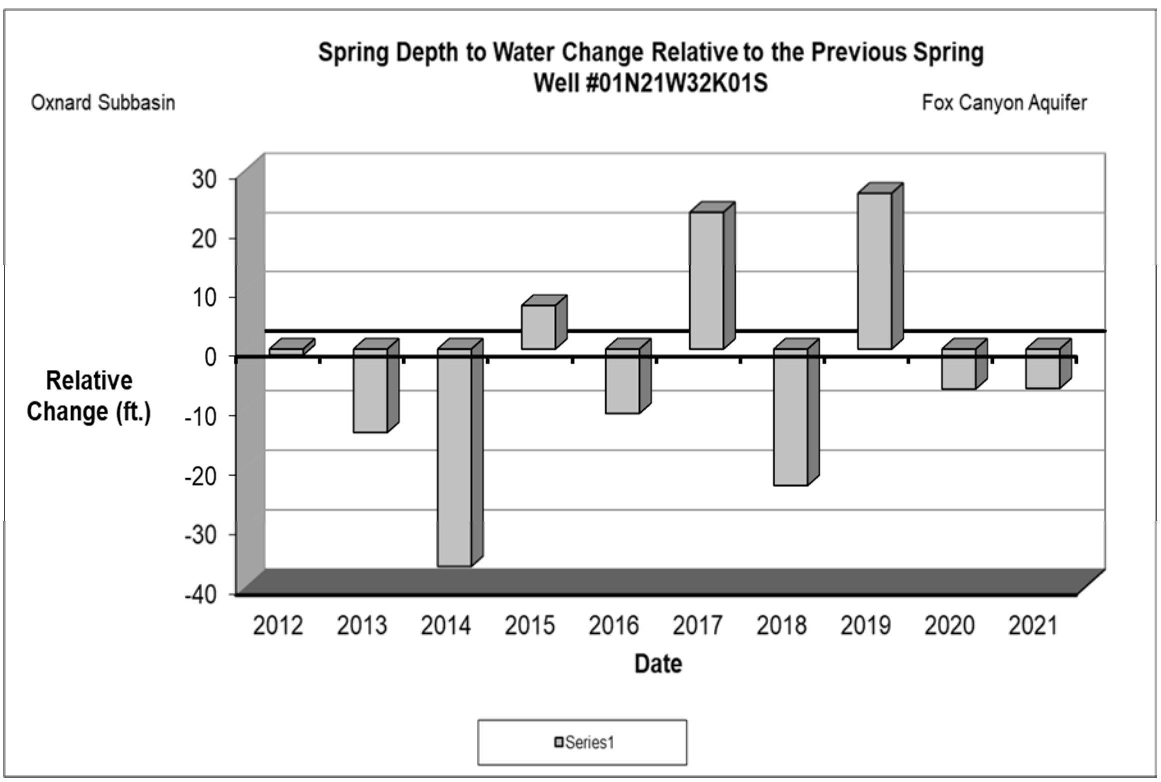

Figure B-7: Oxnard Subbasin Fox Canyon Aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

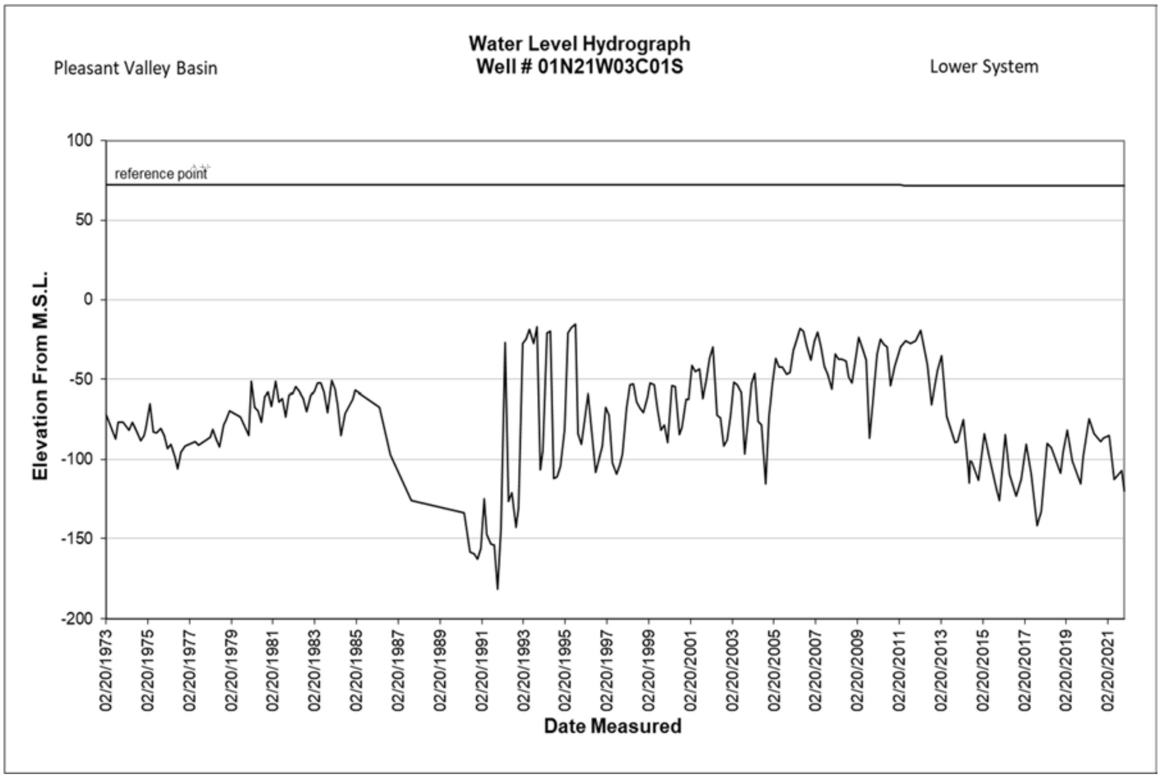

Figure B-8: Pleasant Valley Basin Lower Aquifer System Key Well Hydrograph.

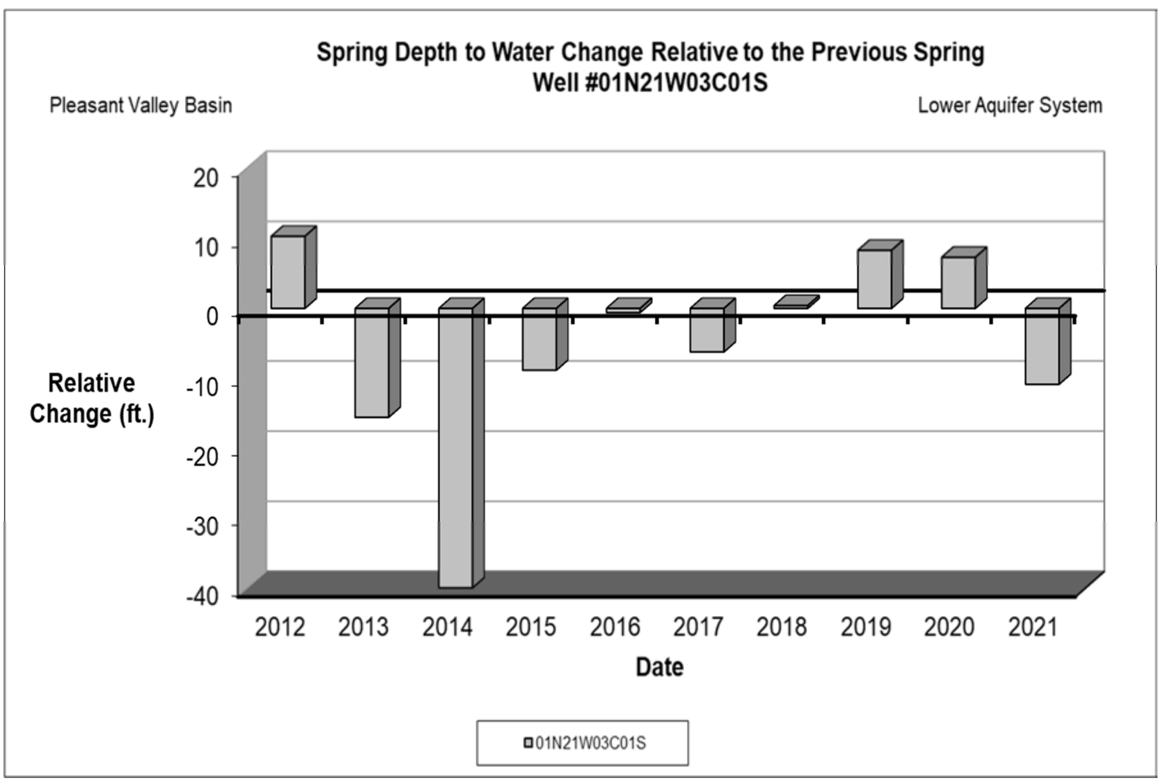

Figure B-9: Pleasant Valley Basin Lower Aquifer System 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

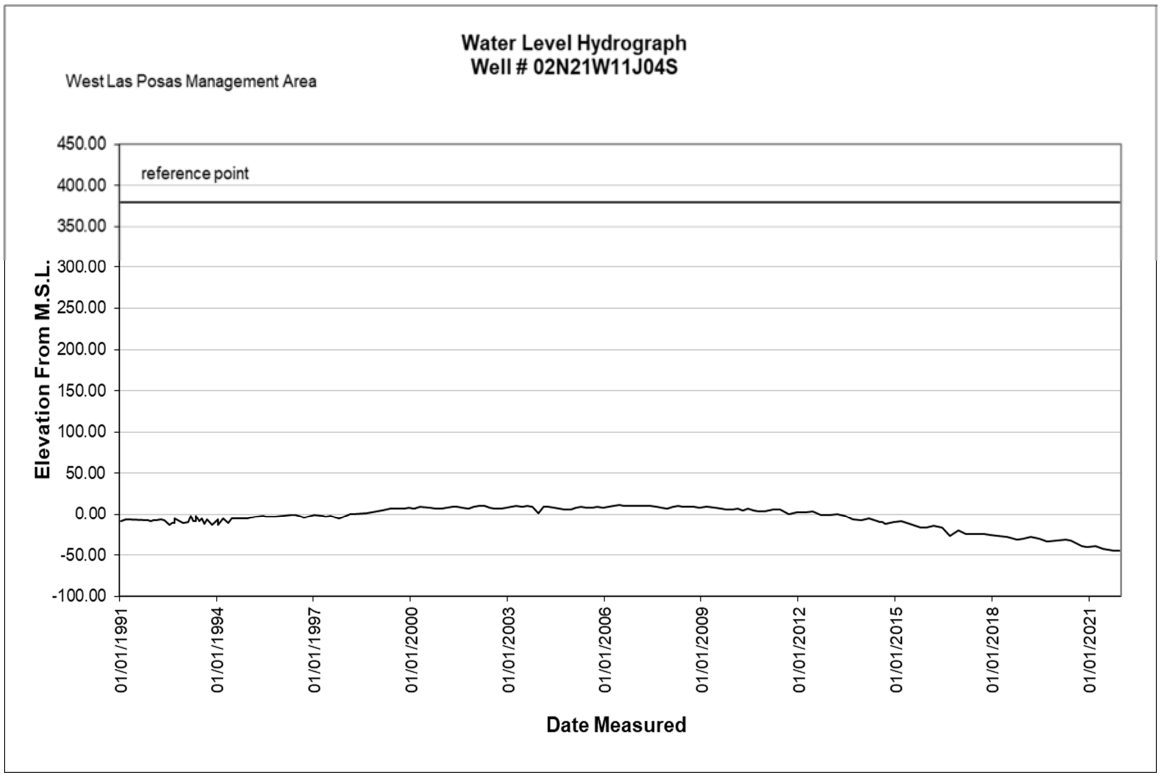

Figure B-10: West Las Posas Management Area Key Well Hydrograph.

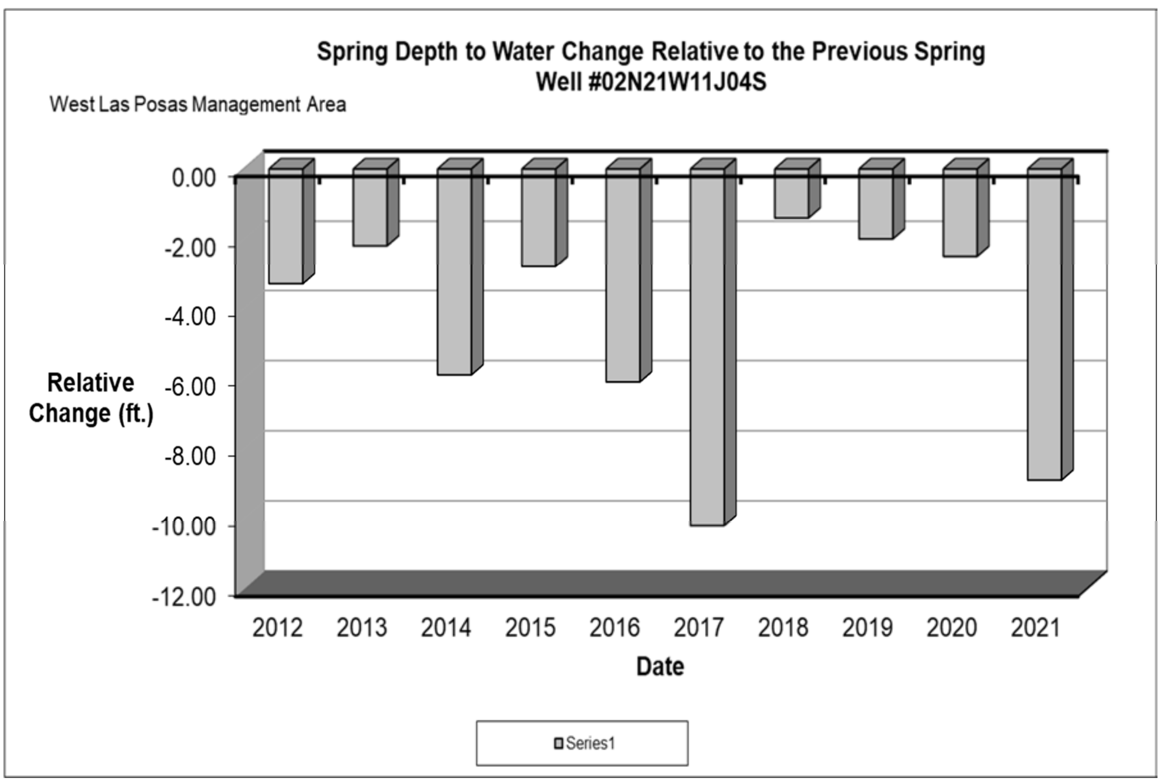

Figure B-11: West Las Posas Management Area 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

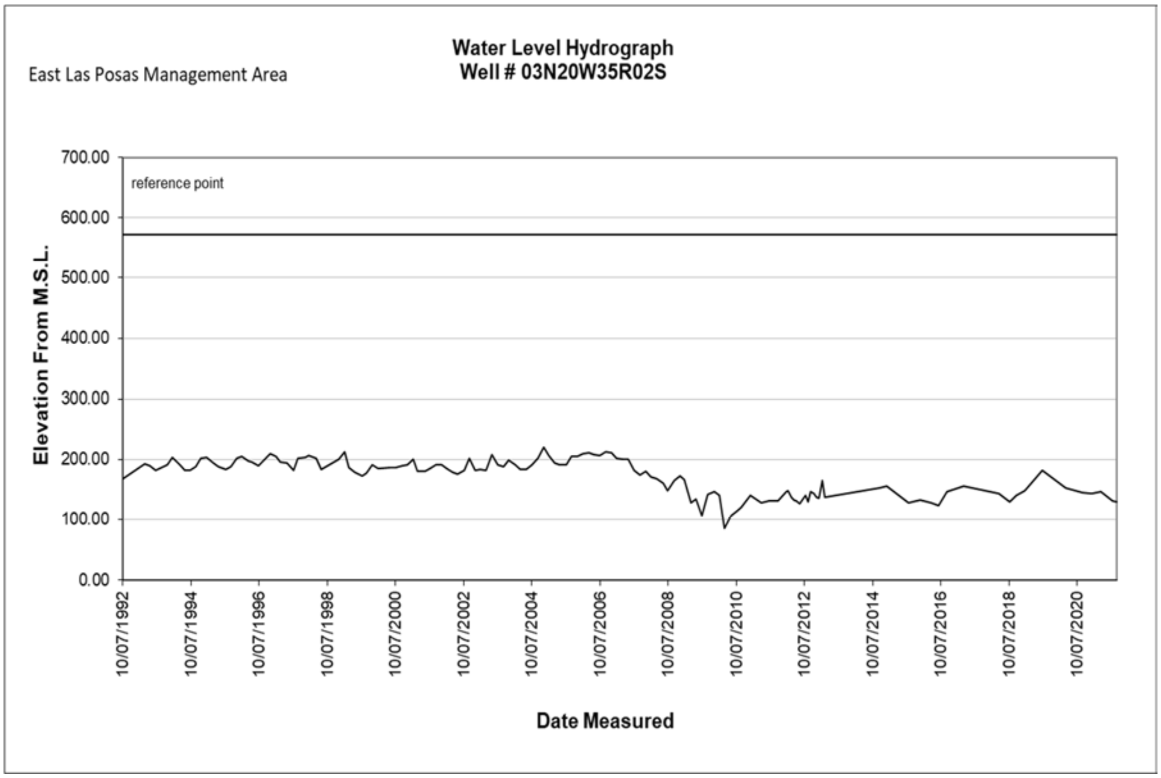

Figure B-12: East Las Posas Management Area Key Well Hydrograph.

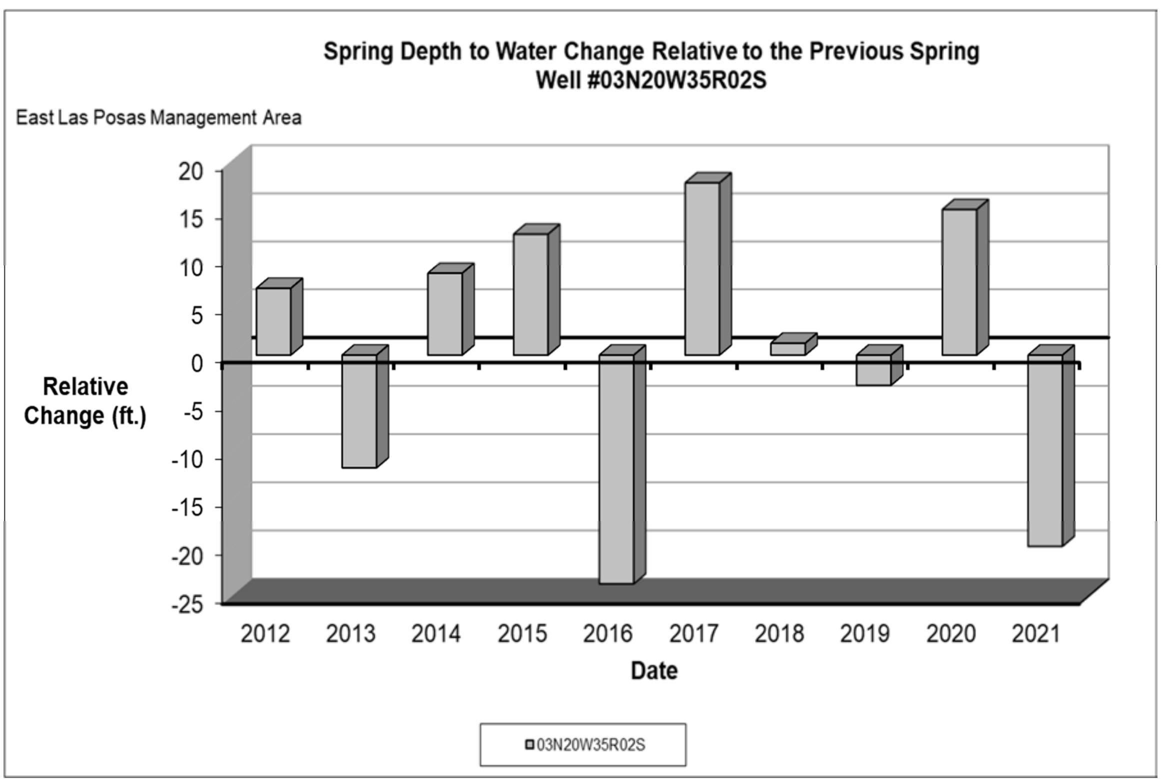

Figure B-13: East Las Posas Management Area 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

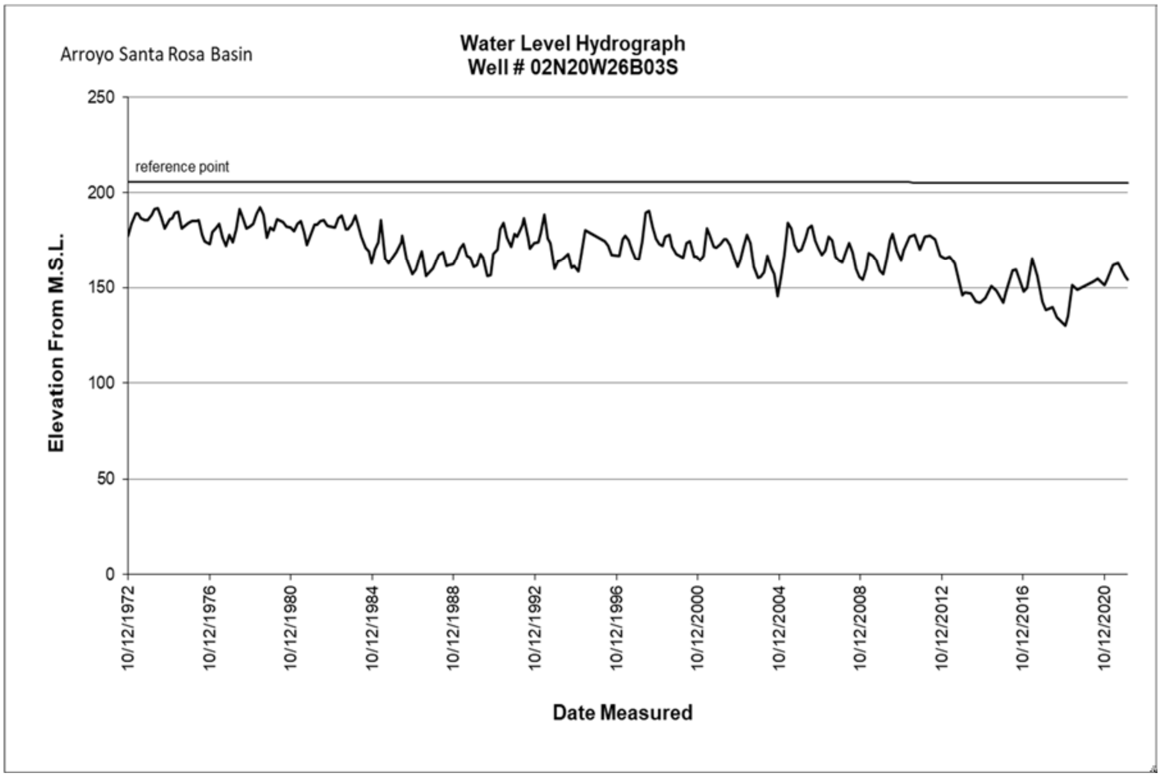

Figure B-14: Arroyo Santa Rosa Basin Key Well Hydrograph.

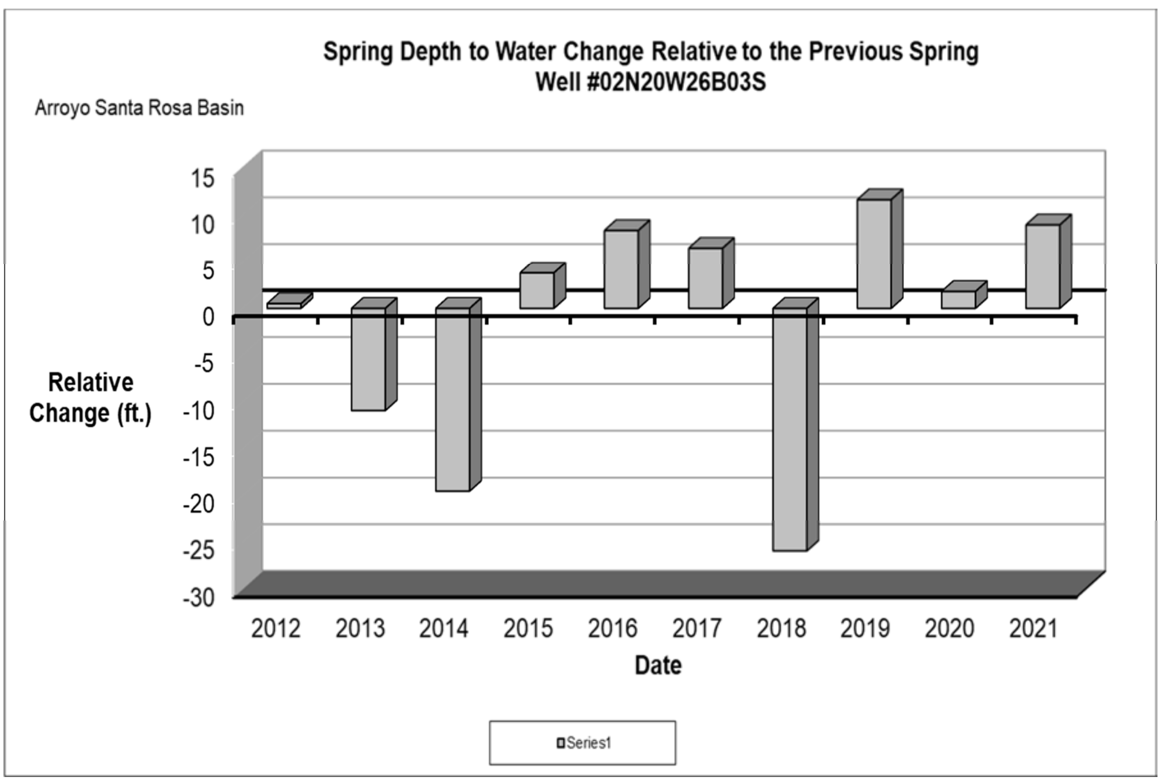

Figure B-15: Arroyo Santa Rosa Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

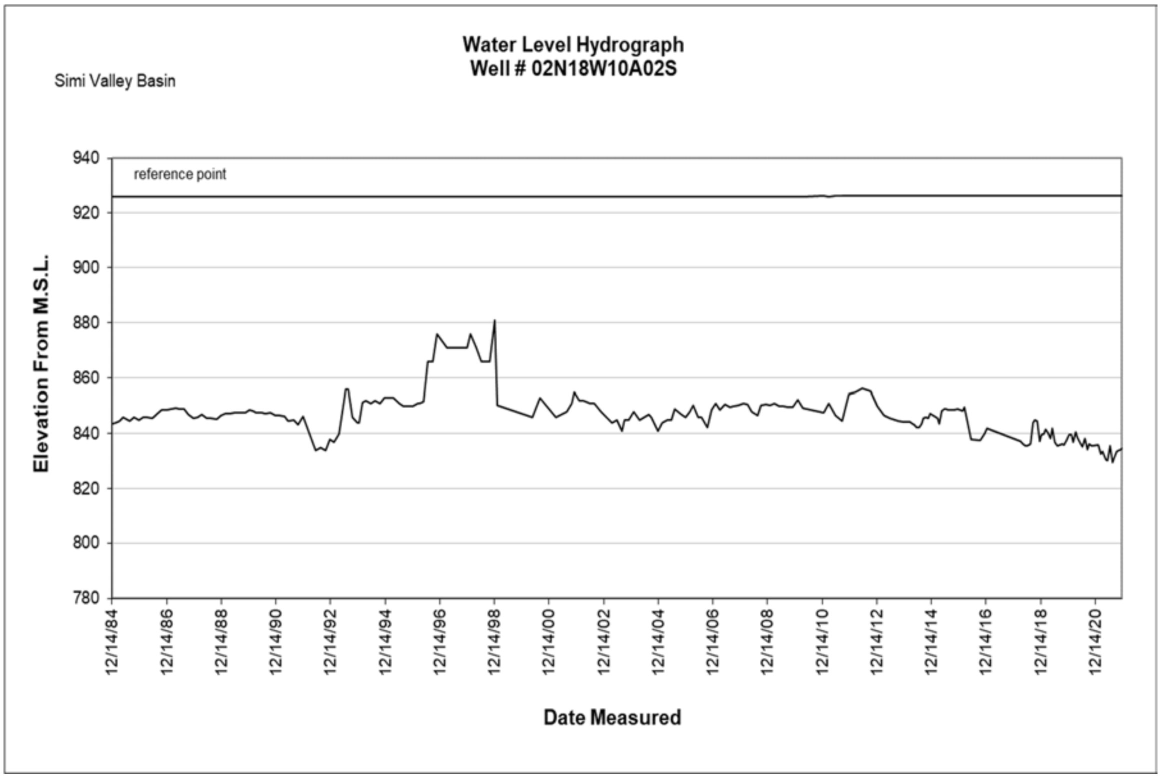

Figure B-16: Simi Valley Basin Key Well Hydrograph.

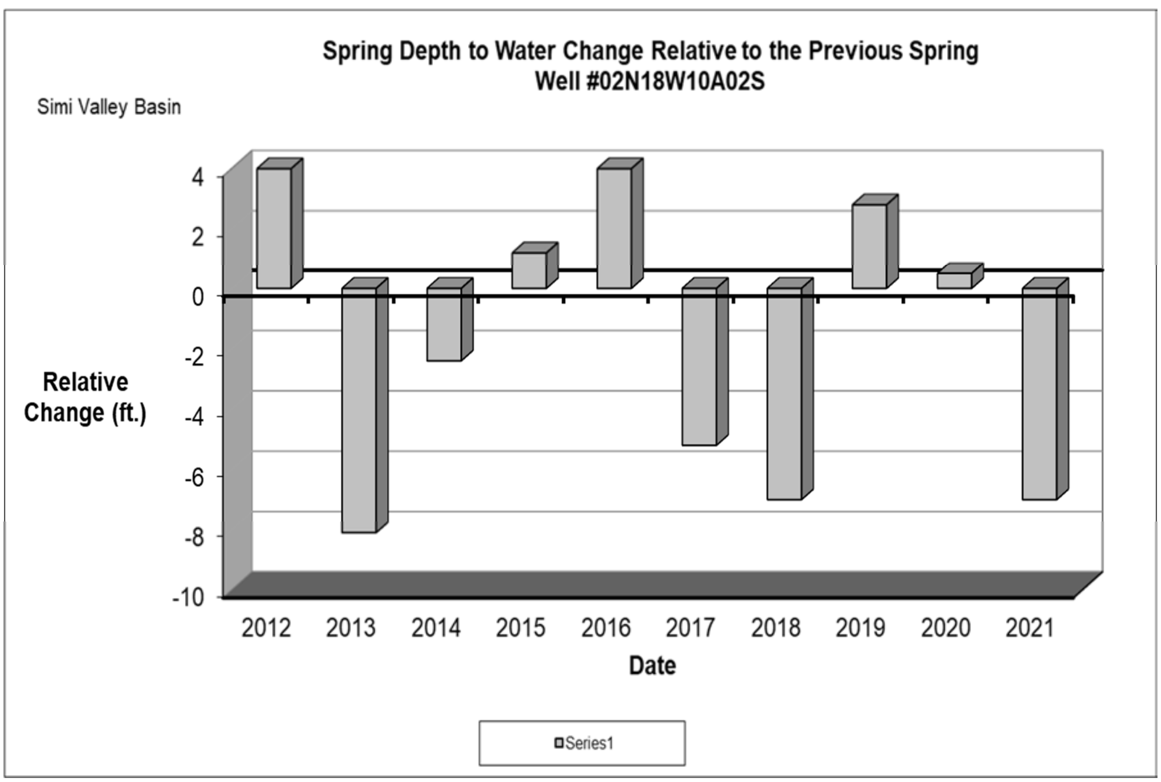

Figure B-17: Simi Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

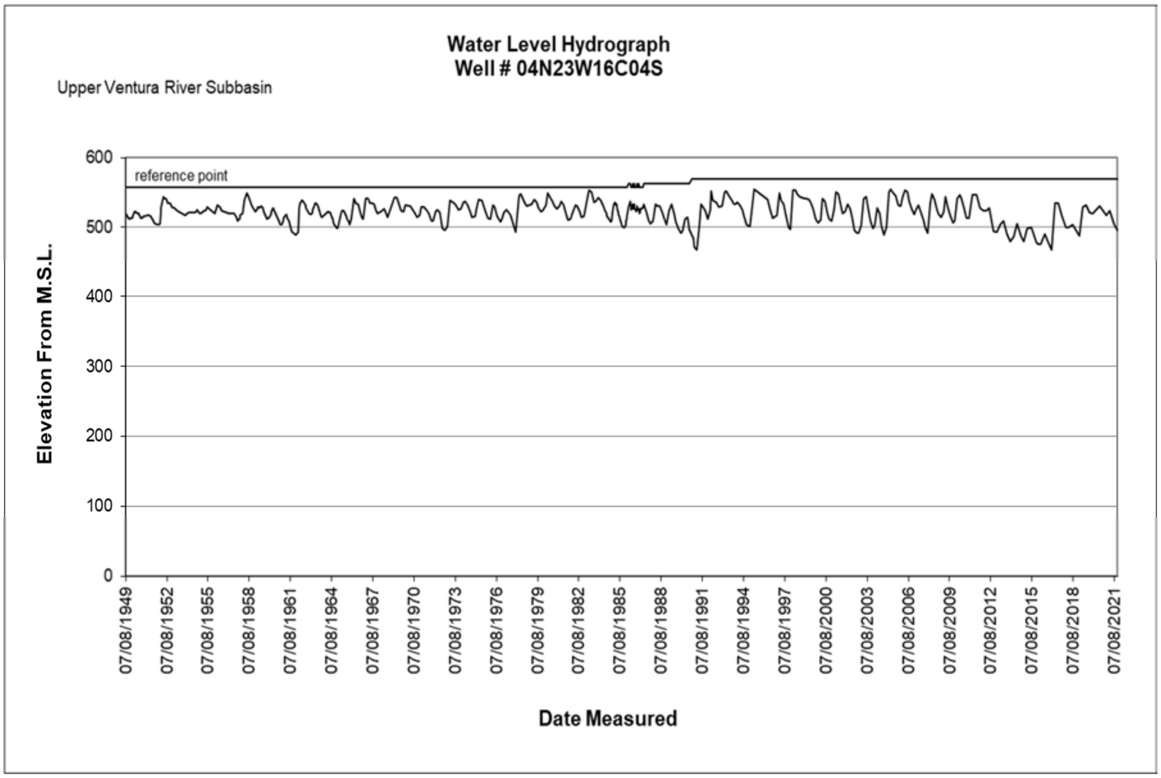

Figure B-18: Upper Ventura River Subbasin Key Well Hydrograph.

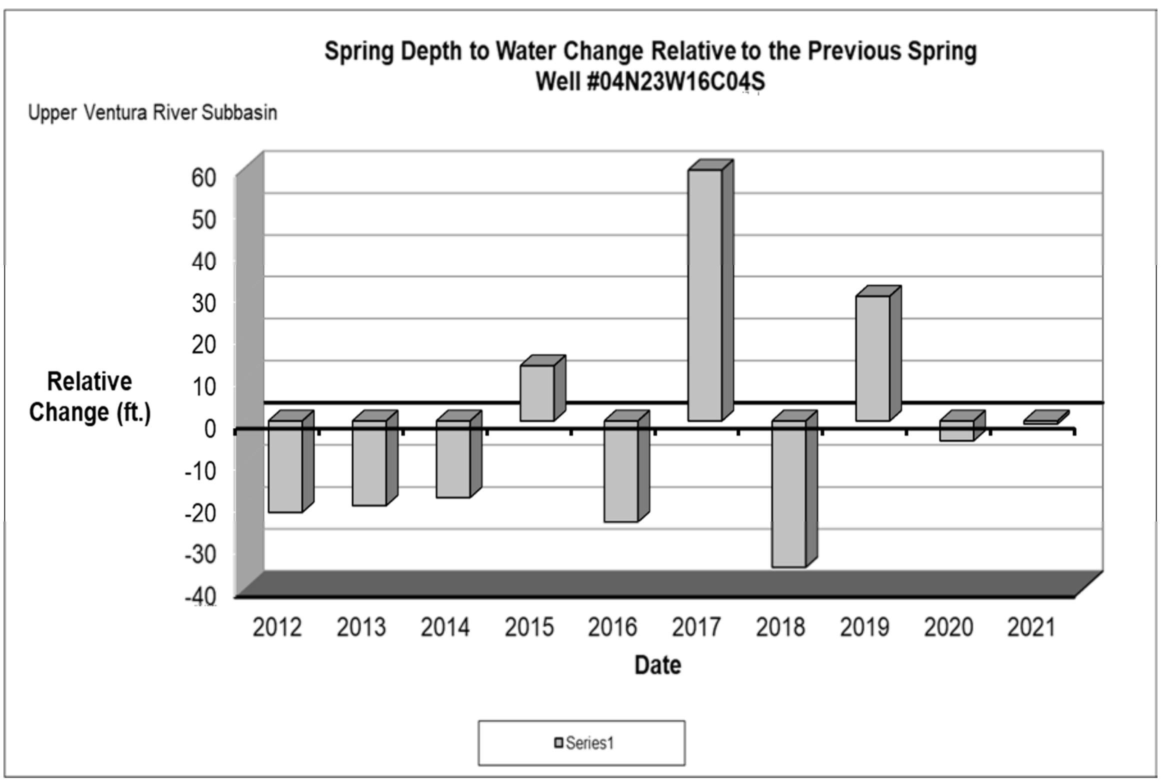

Figure B-19: Upper Ventura River Subbasin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

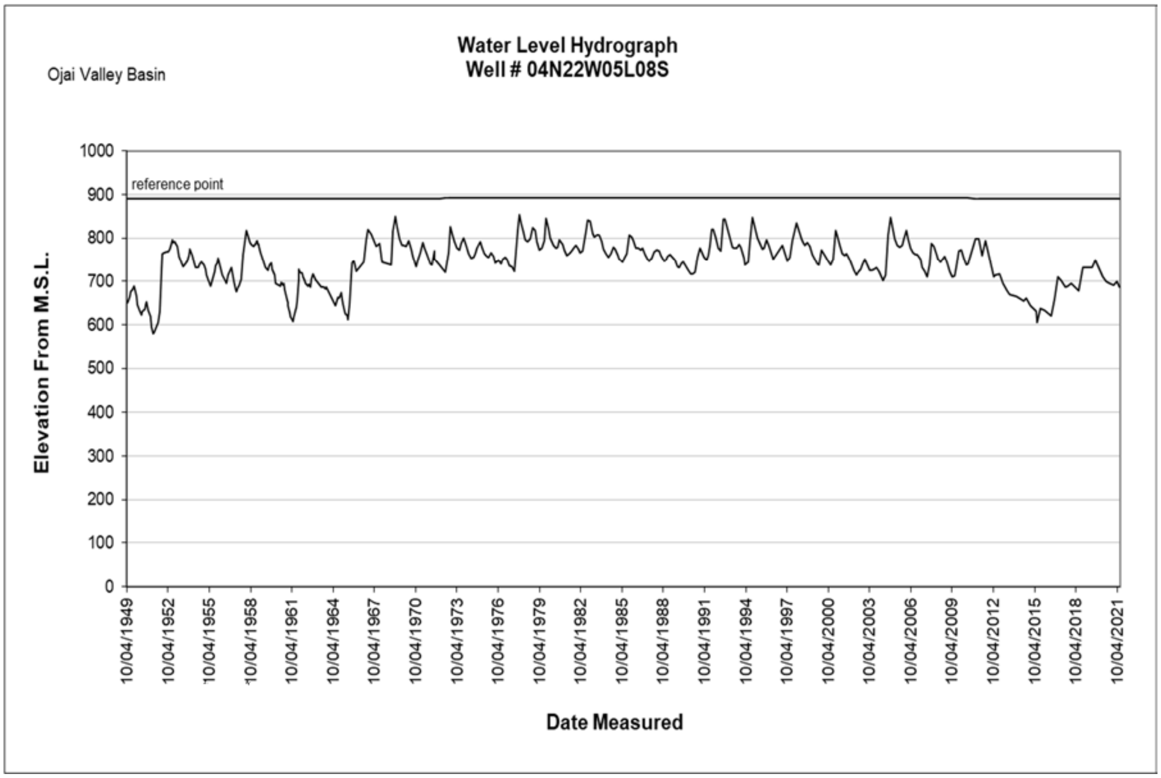

Figure B-20: Ojai Valley Basin Key Well Hydrograph.

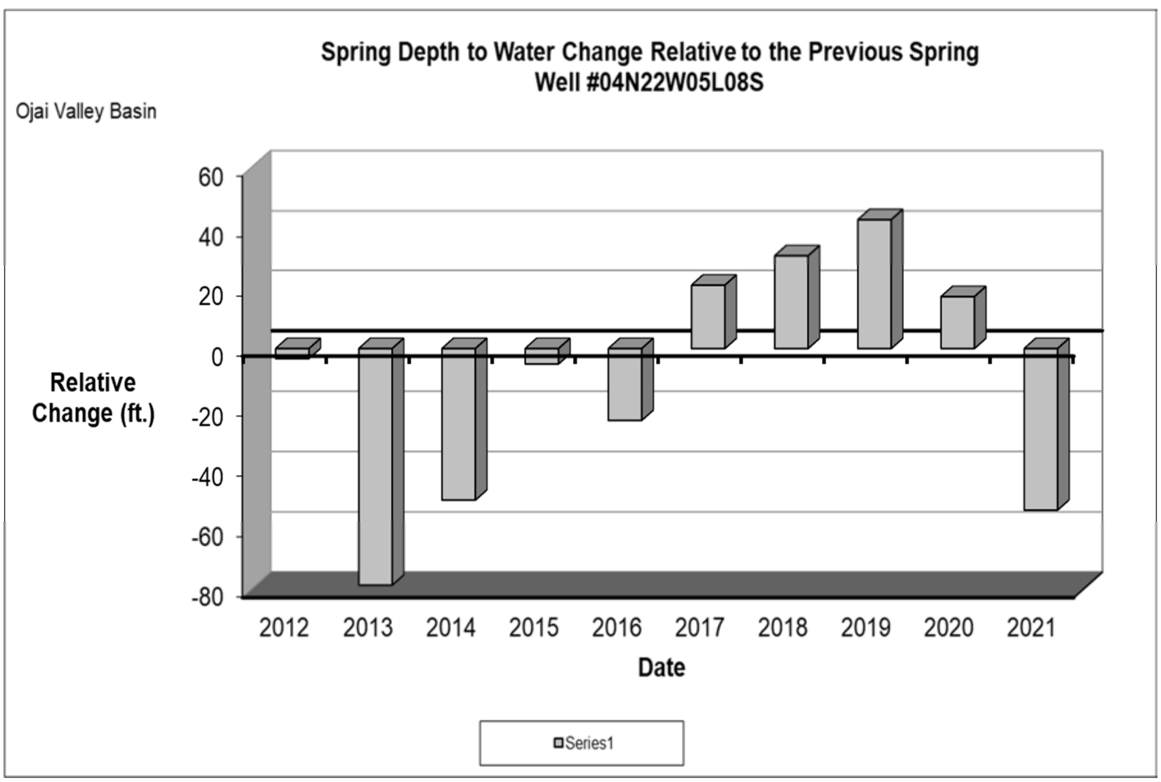

Figure B-21: Ojai Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

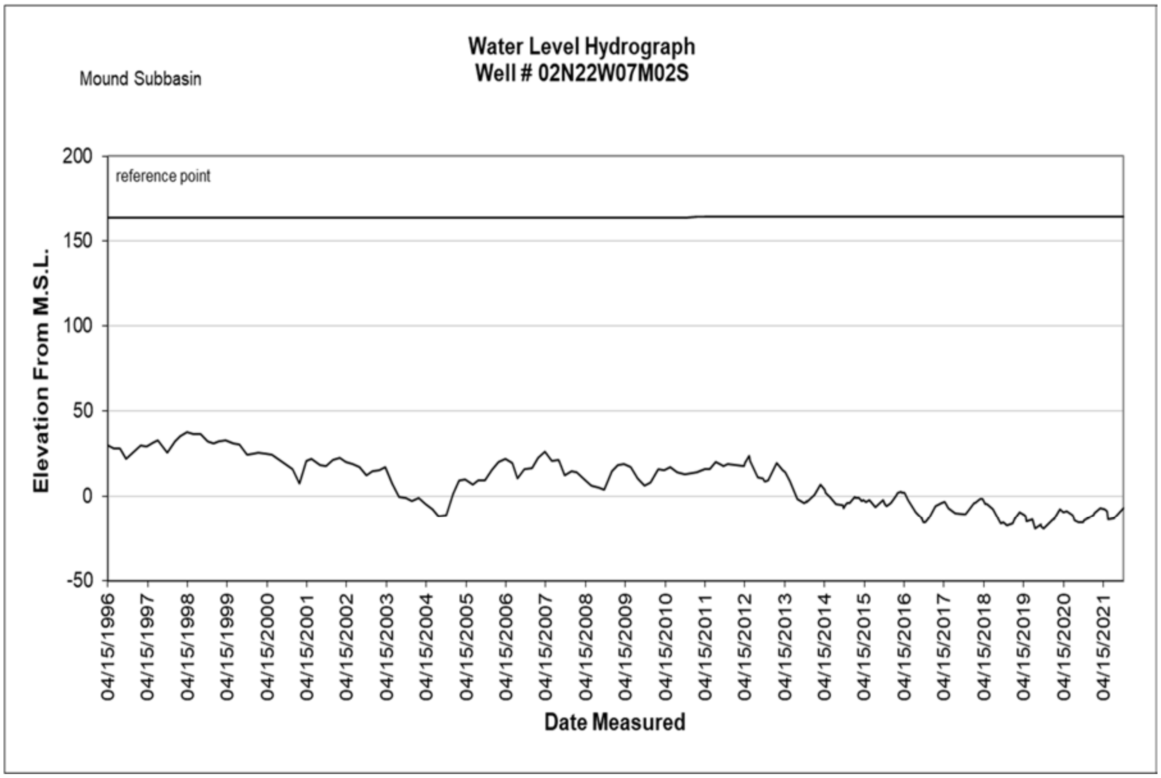

Figure B-22: Mound Subbasin Key Well Hydrograph.

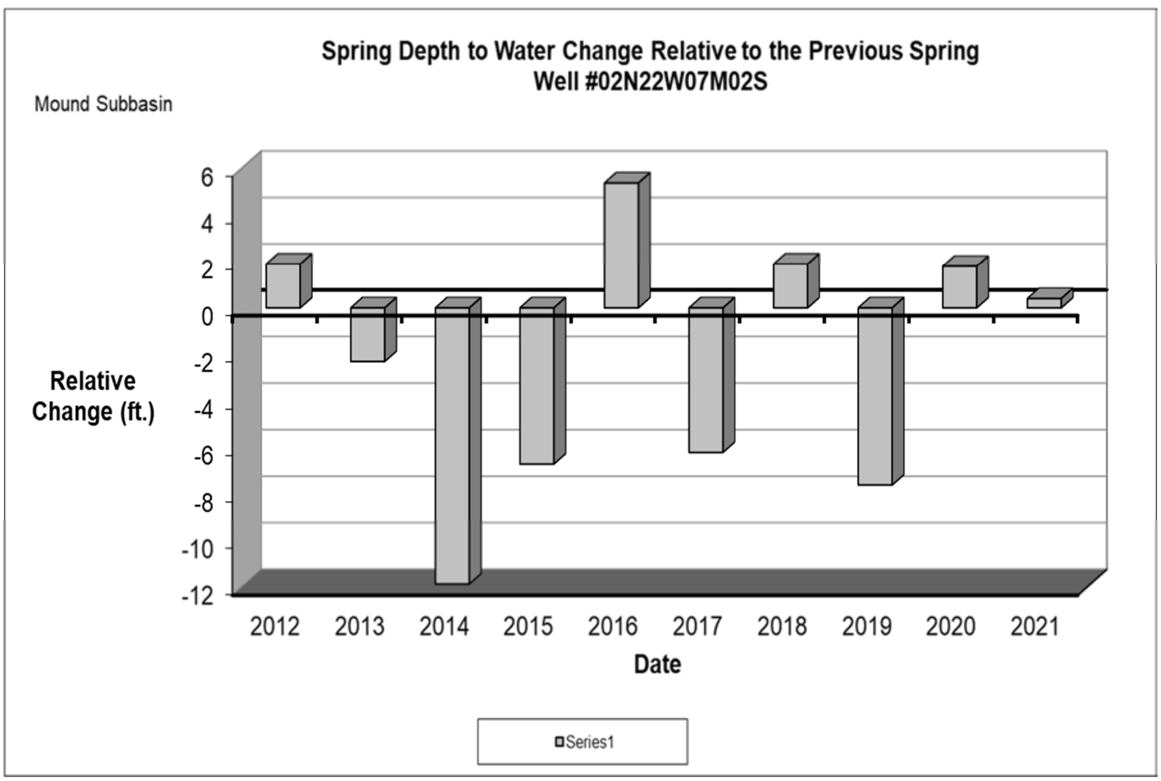

Figure B-23: Mound Subbasin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

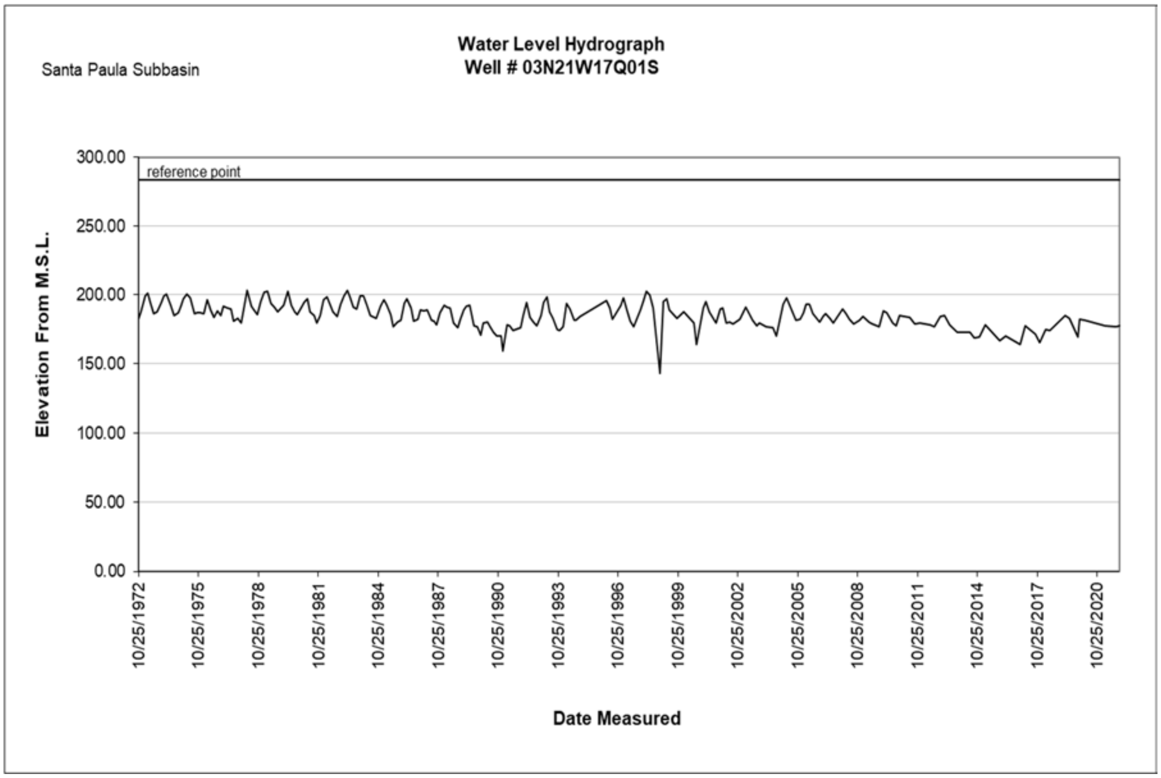

Figure B-24: Santa Paula Subbasin Key Well Hydrograph.

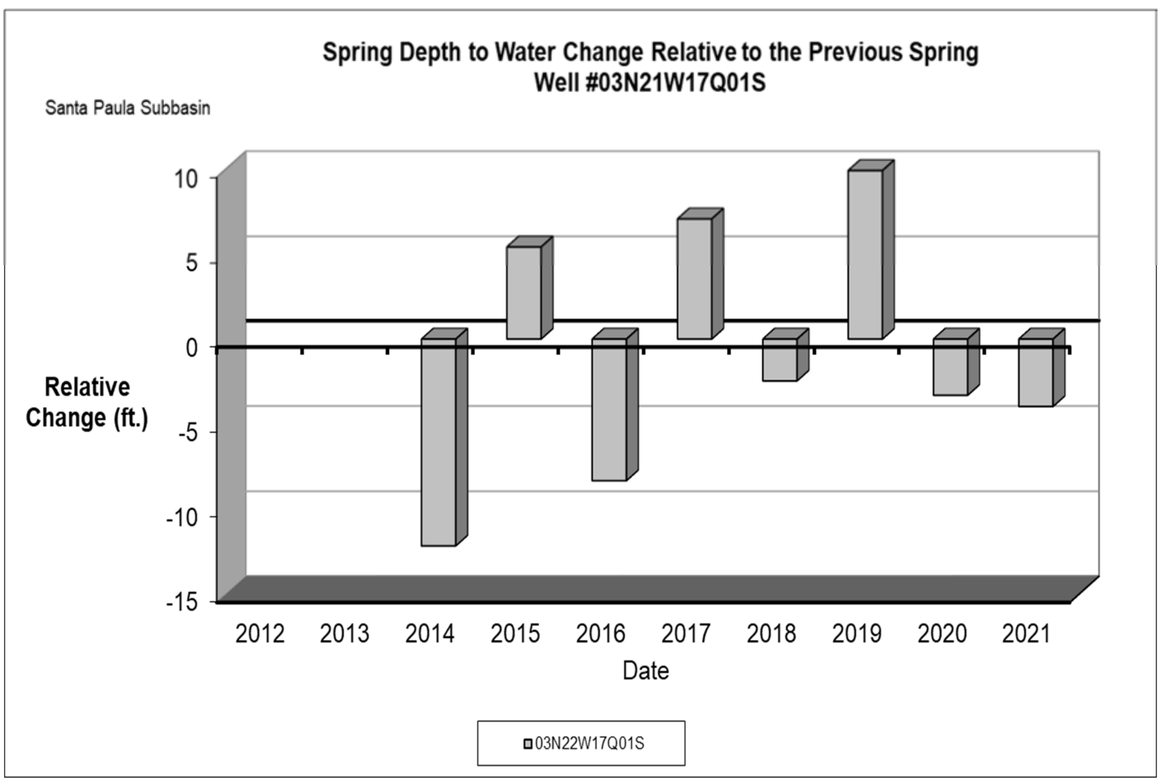

Figure B-25: Santa Paula Subbasin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

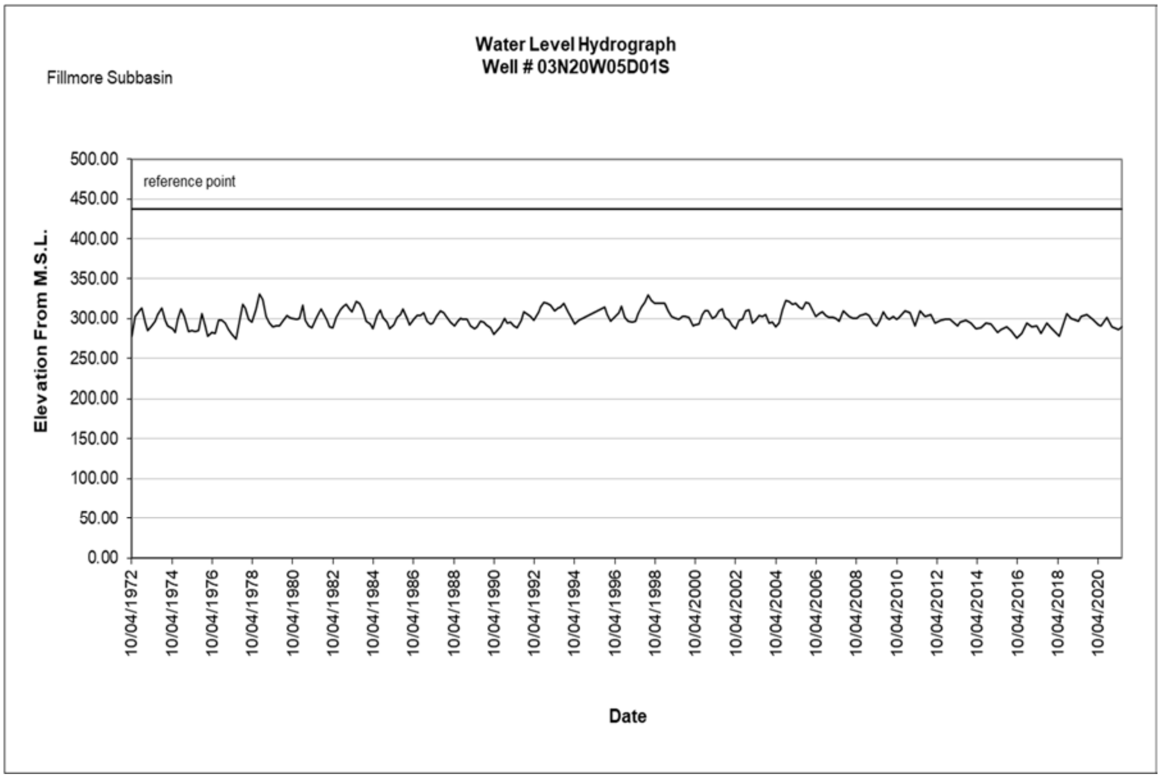

Figure B-26: Fillmore Subbasin Key Well Hydrograph.

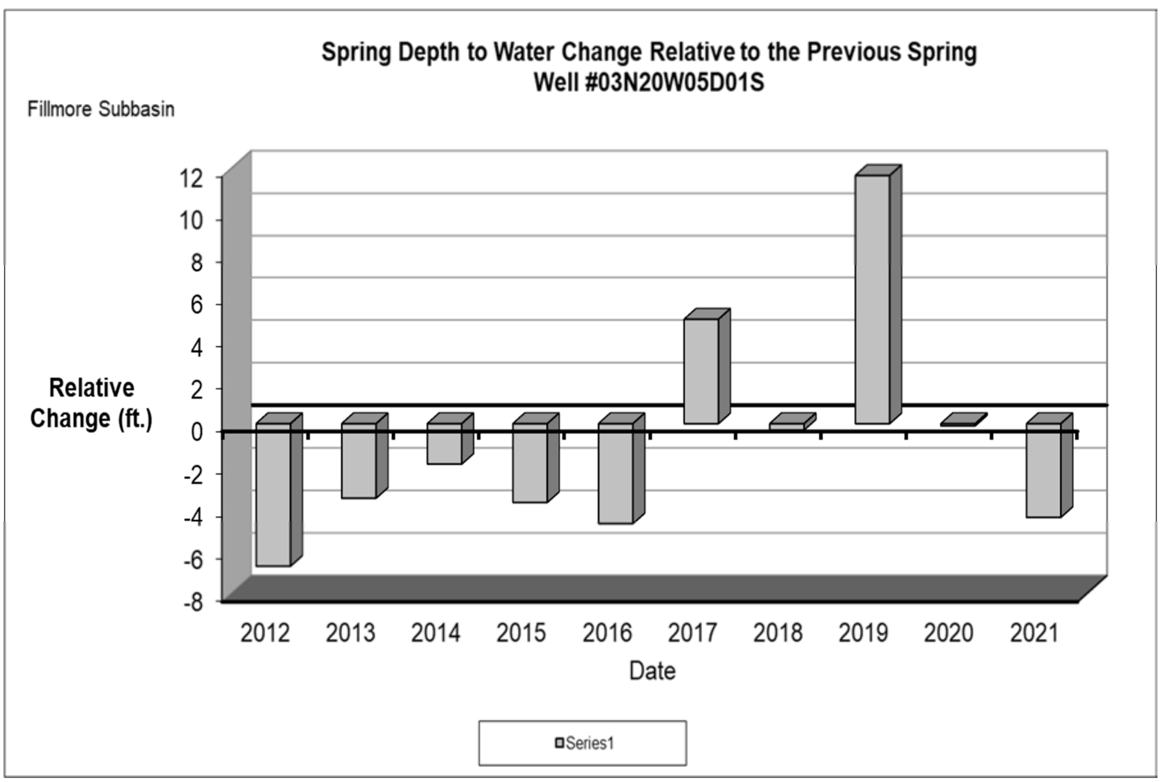

Figure B-27: Fillmore Subbasin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

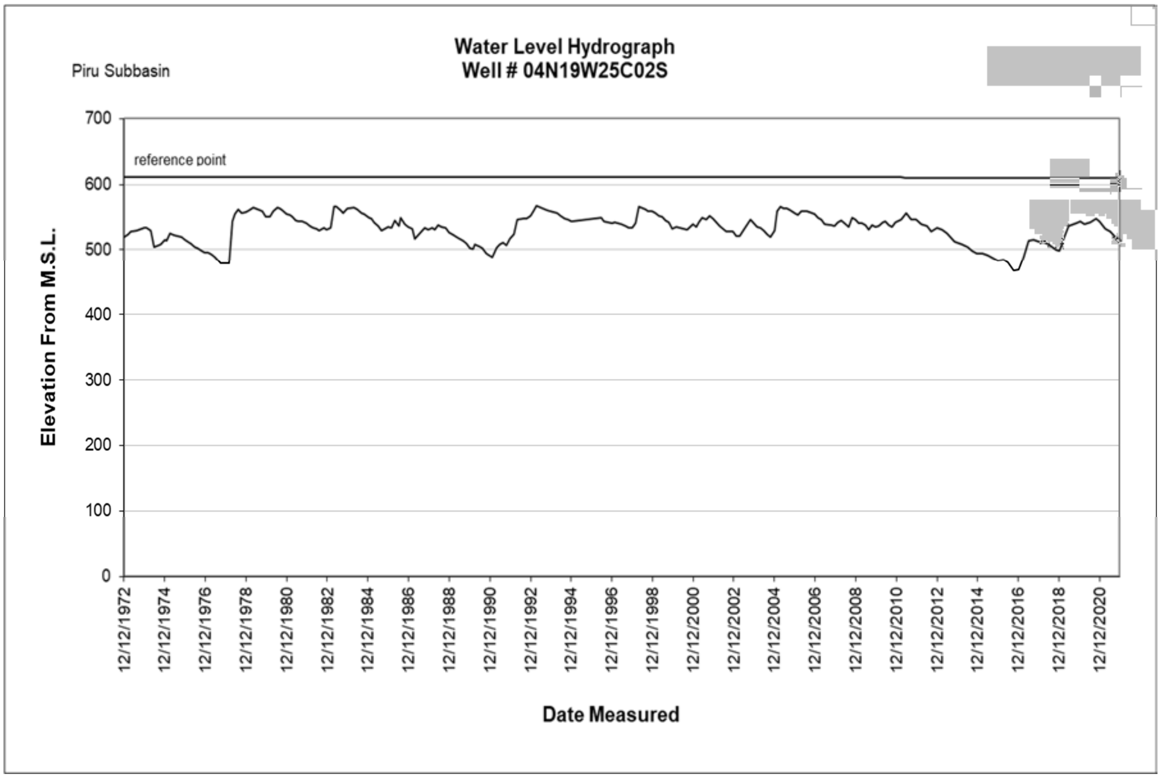

Figure B-28: Piru Subbasin Key Well Hydrograph.

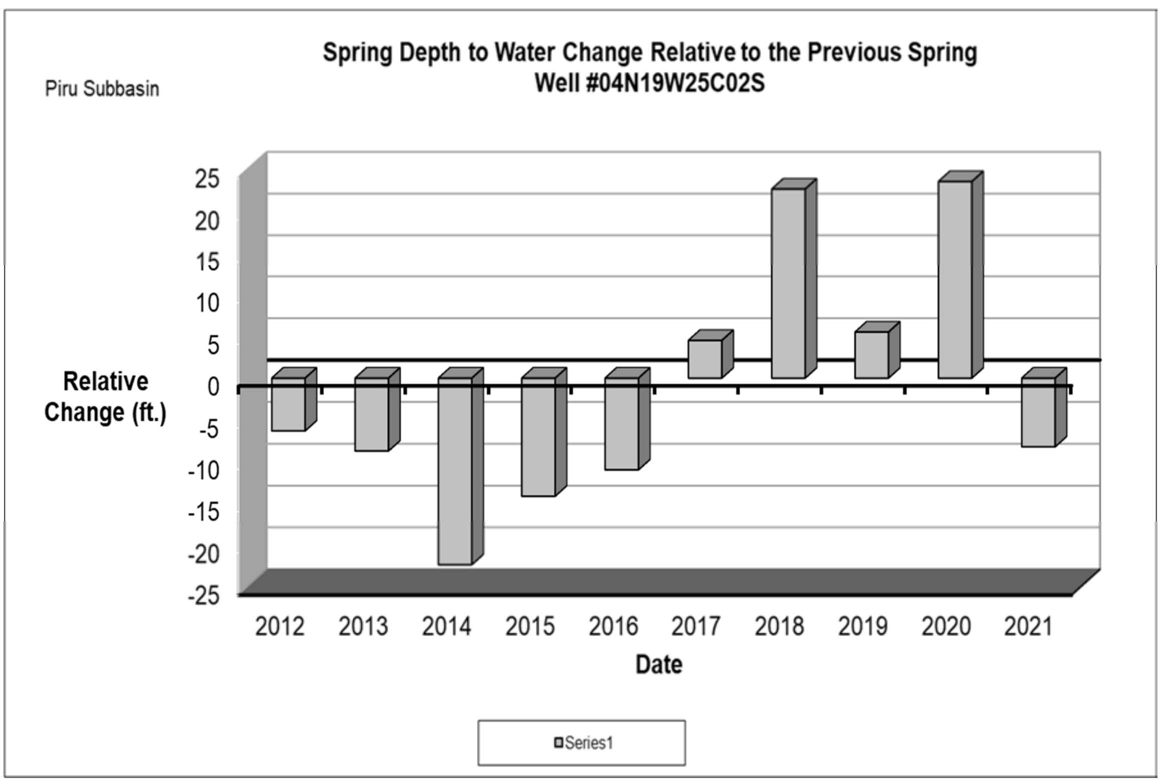

Figure B-29: Piru Subbasin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

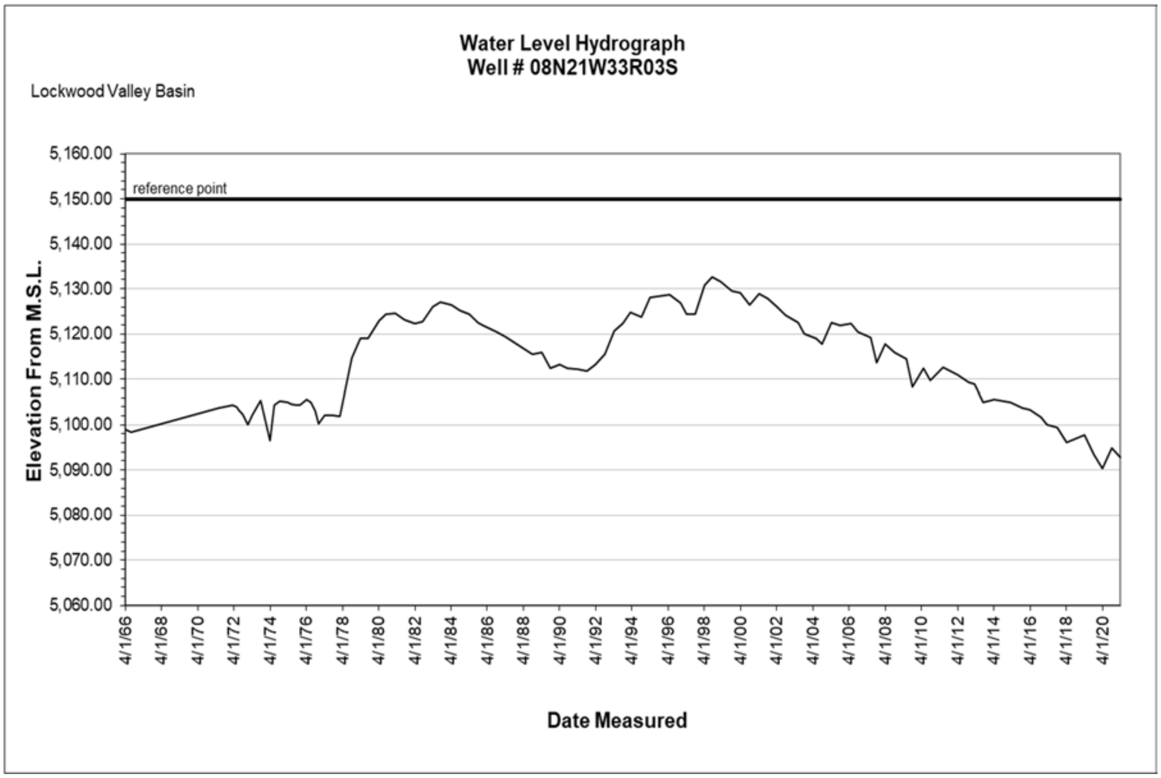

Figure B-30: Lockwood Valley Basin Key Well Hydrograph.

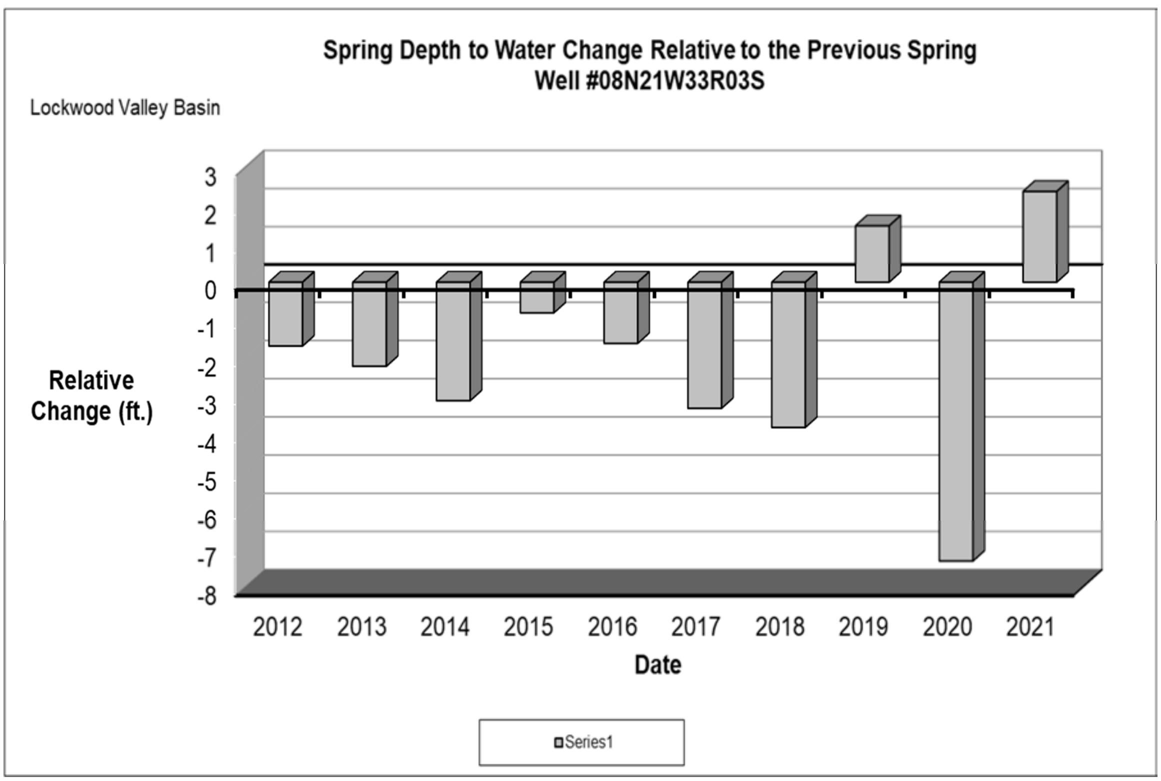

Figure B-31: Lockwood Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

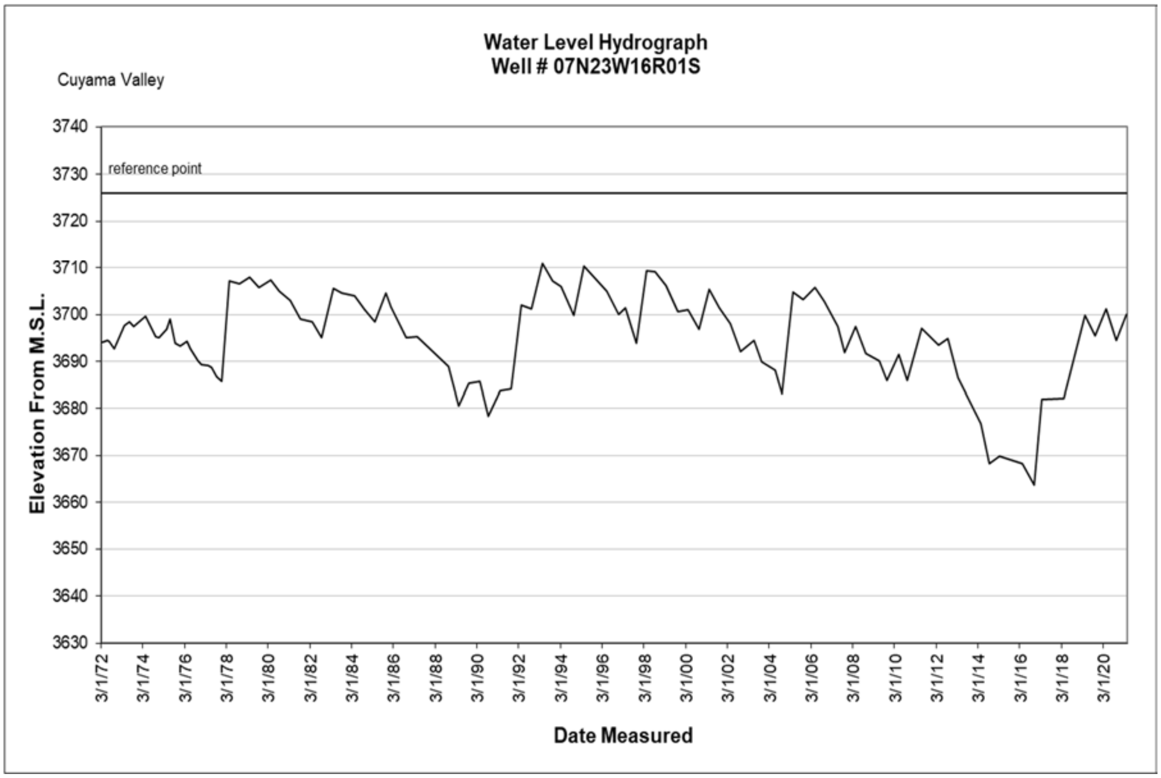

Figure B-32: Cuyama Valley Basin Key Well Hydrograph.

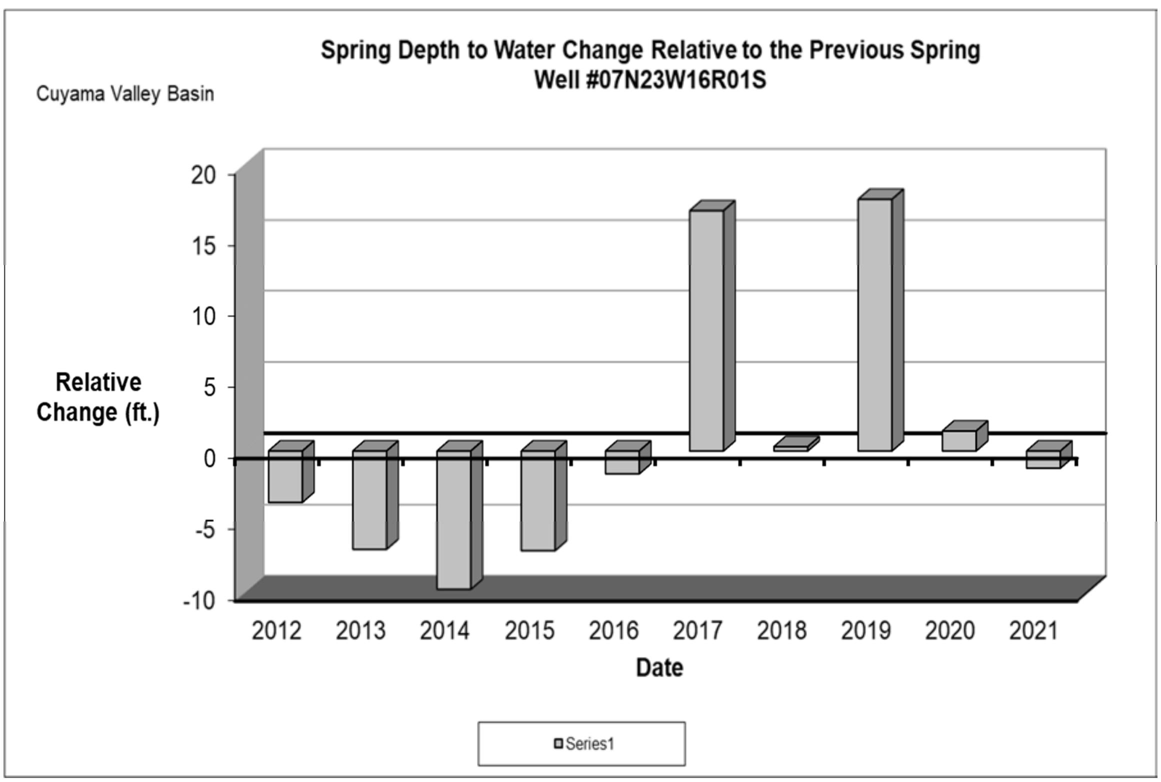

Figure B-33: Cuyama Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Arroyo Santa Rosa Valley	02N19W20L01S	3/17/2021	307.66	106.02	201.64	
		6/10/2021	307.66	----	----	Pumping
		10/13/2021	307.66	112.95	194.71	
		12/2/2021	307.66	----	----	Pumping
	02N20W23G01S	3/17/2021	370.80	296.90	73.90	
		6/10/2021	370.80	300.00	70.80	
		10/13/2021	370.80	299.50	71.30	
		12/2/2021	370.80	299.58	71.22	
	02N20W23K01S	3/17/2021	274.11	201.48	72.63	
		6/10/2021	274.11	213.90	60.21	
		10/13/2021	274.11	211.70	62.41	
		12/2/2021	274.11	209.38	64.73	
	02N20W23R01S	3/17/2021	235.21	78.74	156.47	
		6/10/2021	235.21	----	----	Pumping
		10/13/2021	235.21	----	----	Pumping
		12/2/2021	235.21	----	----	Pumping
	02N20W26B03S	3/17/2021	205.87	43.67	162.20	
		6/10/2021	205.87	42.75	163.12	
		10/13/2021	205.87	49.83	156.04	
		12/2/2021	205.87	51.50	154.37	
Conejo	01N19W07K16S	3/4/2021	635.46	12.40	623.06	
		6/30/2021	635.46	8.90	626.56	
		10/5/2021	635.46	11.15	624.31	
		12/20/2021	635.46	10.00	625.46	
	01N20W03J01S	3/4/2021	764.40	44.30	720.10	
		6/30/2021	764.40	----	----	No Access
		10/5/2021	764.40	49.80	714.60	
		12/20/2021	764.40	50.20	714.20	
Cuddy Ranch Area	08N20W08B01S	4/30/2021	5,300.00	8.50	5,291.50	
		9/28/2021	5,300.00	12.60	5,287.40	
Cuyama Valley	07N23W16R01S*	4/1/2021	3,726.00	25.90	3,700.10	
		9/28/2021	3,726.00	----	----	Dry
	07N23W16R02S	4/1/2021	3,726.00	23.50	3,702.50	
		9/28/2021	3,726.00	34.50	3,691.50	
	07N24W13C03S	4/1/2021	3,435.00	23.70	3,411.30	
		9/28/2021	3,435.00	34.10	3,400.90	
	09N23W30E05S	4/1/2021	3,544.50	193.60	3,350.90	
		9/28/2021	3,544.50	204.50	3,340.00	
	09N24W33J03S	4/1/2021	3,130.00	163.90	2,966.10	
		9/28/2021	3,130.00	163.80	2,966.20	
Fillmore	03N19W06D02S	3/18/2021	434.60	50.84	383.76	
		6/14/2021	434.60	----	----	Pumping
		10/11/2021	434.60	----	----	No Access
		12/3/2021	434.60	63.30	371.30	
	03N20W01C04S	3/18/2021	404.58	30.22	374.36	
		6/14/2021	404.58	33.80	370.78	
		10/11/2021	404.58	40.80	363.78	
		12/3/2021	404.58	42.57	362.01	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Fillmore	03N20W05D01S*	3/18/2021	437.12	136.30	300.82	
		6/14/2021	437.12	147.75	289.37	
		10/11/2021	437.12	151.33	285.79	
		12/3/2021	437.12	147.05	290.07	
	03N20W09D01S	3/18/2021	325.20	----	----	Pumping
		6/14/2021	325.20	----	----	Pumping
		10/11/2021	325.20	----	----	Pumping
		12/3/2021	325.20	----	----	Pumping
	03N20W11C01S	3/18/2021	397.11	44.70	352.41	
		6/14/2021	397.11	48.90	348.21	
		10/11/2021	397.11	53.67	343.44	
		12/3/2021	397.11	54.85	342.26	
	03N21W01P02S	3/18/2021	301.85	42.74	259.11	
		6/14/2021	301.85	47.33	254.52	
		10/11/2021	301.85	48.85	253.00	
		12/3/2021	301.85	50.60	251.25	
	04N19W30D01S	3/18/2021	434.43	45.20	389.23	
		6/14/2021	434.43	----	----	Pumping
		10/11/2021	434.43	----	----	Pumping
		12/3/2021	434.43	61.27	373.16	
	04N19W31R01S	3/18/2021	448.85	50.12	398.73	
		6/14/2021	448.85	52.33	396.52	
		10/11/2021	448.85	59.08	389.77	
		12/3/2021	448.85	61.85	387.00	
	04N19W32M02S	3/18/2021	449.46	17.57	431.89	
		6/14/2021	449.46	----	----	Pumping
		10/11/2021	449.46	----	----	Pumping
		12/3/2021	449.46	22.52	426.94	
	04N19W33D03S	3/18/2021	477.43	3.67	473.76	
		6/14/2021	477.43	6.10	471.33	
		10/11/2021	477.43	7.67	469.76	
		12/3/2021	477.43	9.10	468.33	
	04N19W33D04S	3/18/2021	477.90	2.23	475.67	
		6/14/2021	477.90	----	----	Pumping
		10/11/2021	477.90	----	----	Pumping
		12/3/2021	477.90	----	----	Pumping
	04N20W23Q02S	3/18/2021	513.88	126.60	387.28	
		6/14/2021	513.88	----	----	Pumping
		10/11/2021	513.88	140.70	373.18	
		12/3/2021	513.88	138.88	375.00	
	04N20W26C02S	3/18/2021	505.35	125.81	379.54	
		6/14/2021	505.35	137.20	368.15	
		10/11/2021	505.35	140.30	365.05	
		12/3/2021	505.35	142.62	362.73	
	04N20W33C03S	3/18/2021	526.87	----	----	No Site Access
		6/14/2021	526.87	----	----	No Site Access
		10/11/2021	526.87	----	----	No Site Access
		12/3/2021	526.87	----	----	No Site Access

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Hidden Valley	01N19W19L02S	3/4/2021	1,082.00	----	----	Pumping
		6/30/2021	1,082.00	----	----	No Access
		10/5/2021	1,082.00	299.88	782.12	
		12/20/2021	1,082.00	299.88	782.12	
	01N19W30A01S	3/4/2021	999.98	46.10	953.88	
		6/30/2021	999.98	47.30	952.68	
		10/5/2021	999.98	51.65	948.33	
		12/20/2021	999.98	50.10	949.88	
Las Posas Valley – East Management Area	02N19W05K01S*	3/9/2021	497.80	----	----	Full of Rocks
		6/15/2021	497.80	----	----	Full of Rocks
		10/18/2021	497.80	----	----	Full of Rocks
		12/8/2021	497.80	----	----	Full of Rocks
	02N19W08H02S	3/22/2021	494.87	28.25	466.62	
		6/15/2021	494.87	28.25	466.62	
		10/21/2021	494.87	26.90	467.97	
		12/8/2021	494.87	28.00	466.87	
	02N20W03K03S	3/22/2021	485.50	335.59	149.91	
		6/15/2021	485.50	----	----	Pumping
		10/18/2021	485.50	360.20	125.30	
		12/7/2021	485.50	354.80	130.70	
	02N20W10D02S	3/10/2021	459.53	314.25	145.28	
		6/15/2021	459.53	327.10	132.43	
		10/18/2021	459.53	328.30	131.23	
		12/7/2021	459.53	324.95	134.58	
	02N20W10G01S	3/10/2021	415.47	166.85	248.62	
		6/15/2021	415.47	----	----	Pumping
		10/18/2021	415.47	----	----	Pumping
		12/7/2021	415.47	----	----	Pumping
	02N20W10J01S	3/10/2021	406.87	126.75	280.12	
		6/15/2021	406.87	128.65	278.22	
		10/18/2021	406.87	133.50	273.37	
		12/7/2021	406.87	132.92	273.95	
	03N19W19J01S	3/9/2021	1,026.90	860.70	166.20	
		6/15/2021	1,026.90	861.00	165.90	
		10/18/2021	1,026.90	866.50	160.40	
		12/8/2021	1,026.90	866.10	160.80	
	03N19W29F06S	3/9/2021	855.20	303.60	551.60	
		6/15/2021	855.20	----	----	Meter Would Not Stabilize
		10/18/2021	855.20	313.30	541.90	
		12/8/2021	855.20	----	----	Meter Would Not Stabilize
	03N20W25H01S	3/9/2021	823.84	218.50	605.34	
		6/15/2021	823.84	----	----	Pumping
		10/19/2021	823.84	----	----	Pumping
		12/8/2021	823.84	----	----	No Site Access

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Las Posas Valley – East Management Area	03N20W26R03S*	3/9/2021	717.81	576.80	141.01	
		6/15/2021	717.81	585.40	132.41	
		10/20/2021	717.81	594.50	123.31	
		12/8/2021	717.81	591.40	126.41	
	03N20W27H01S	3/10/2021	840.24	653.08	187.17	
		6/15/2021	840.25	656.10	184.15	
		10/18/2021	840.25	659.30	180.95	
		12/7/2021	840.25	658.60	181.65	
	03N20W27H03S	3/10/2021	840.25	----	----	Pumping
		6/15/2021	840.25	----	----	Pumping
		10/27/2021	840.25	760.30	79.95	Pumping
		12/7/2021	840.25	0.00	840.25	Pumping
	03N20W34G01S	3/10/2021	680.48	537.10	143.38	
		6/15/2021	680.48	----	----	Pumping
		10/18/2021	680.48	554.50	125.98	
		12/7/2021	680.48	553.50	126.98	
	03N20W35R02S	3/10/2021	572.67	428.50	144.17	
		6/15/2021	572.67	426.60	146.07	
		10/18/2021	572.67	441.20	131.47	
		12/8/2021	572.67	442.30	130.37	
	03N20W35R03S	3/10/2021	572.67	427.80	144.87	
		6/15/2021	572.67	436.40	136.27	
		10/18/2021	572.67	441.30	131.37	
		12/8/2021	572.67	442.40	130.27	
	03N20W35R04S	3/10/2021	572.67	309.30	263.37	
		6/15/2021	572.67	309.80	262.87	
		10/18/2021	572.67	310.20	262.47	
		12/8/2021	572.67	310.10	262.57	
Las Posas Valley – West Management Area	02N20W05D01S	3/9/2021	569.00	715.40	-146.40	
		6/15/2021	569.00	----	----	No site access
		10/18/2021	569.00	----	----	No site access
		12/8/2021	569.00	----	----	No site access
	02N20W06R01S	3/10/2021	461.19	----	----	Meter Would Not Stabilize
		6/9/2021	461.19	----	----	Pumping
		10/18/2021	461.19	663.10	-201.91	
		12/7/2021	461.19	----	----	Pumping
	02N20W07R03S	3/9/2021	395.00	561.09	-166.09	
		6/14/2021	395.00	----	----	Pumping
		10/18/2021	395.00	572.60	-177.60	
		12/7/2021	395.00	----	----	Pumping
	02N20W18A01S	3/10/2021	375.60	533.69	-158.09	
		6/16/2021	375.60	543.30	-167.70	
		10/18/2021	375.60	544.60	-169.00	
		12/7/2021	375.60	547.04	-171.44	
	02N21W08H03S	3/10/2021	334.21	386.93	-52.72	
		6/15/2021	334.21	----	----	Pumping
		10/26/2021	334.21	416.40	-82.19	
		12/8/2021	334.21	417.68	-83.47	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Las Posas Valley – West Management Area	02N21W09D02S	3/20/2021	323.75	258.06	65.69	
		10/22/2021	323.75	252.00	71.75	
	02N21W10G03S	3/9/2021	381.01	430.82	-49.81	
		6/14/2021	381.01	----	----	Pumping
		10/26/2021	381.01	440.10	-59.09	
		12/7/2021	381.01	438.63	-57.62	
	02N21W11J03S*	3/9/2021	379.39	451.60	-72.21	
		6/14/2021	379.39	458.40	-79.01	
		10/19/2021	379.39	459.70	-80.31	
		12/7/2021	379.39	457.10	-77.71	
	02N21W11J04S	3/9/2021	379.39	419.10	-39.71	
		6/14/2021	379.39	421.70	-42.31	
		10/19/2021	379.39	424.60	-45.21	
		12/7/2021	379.39	424.50	-45.11	
	02N21W11J05S	3/9/2021	379.39	220.90	158.49	
		6/14/2021	379.39	222.70	156.69	
		10/19/2021	379.39	225.70	153.69	
		12/7/2021	379.39	224.50	154.89	
	02N21W11J06S	3/9/2021	379.39	185.90	193.49	
		6/14/2021	379.39	185.80	193.59	
		10/19/2021	379.39	187.90	191.49	
		12/7/2021	379.39	187.40	191.99	
	02N21W12H01S	3/9/2021	417.89	455.50	-37.61	
		6/14/2021	417.89	461.40	-43.51	
		10/18/2021	417.89	464.70	-46.81	
		12/7/2021	417.89	461.60	-43.71	
	02N21W13A01S	3/22/2021	440.00	600.30	-160.30	
		6/16/2021	440.00	607.00	-167.00	
		10/21/2021	440.00	611.60	-171.60	
		12/8/2021	440.00	613.30	-173.30	
	02N21W15M03S	3/9/2021	263.87	331.80	-67.93	
		6/14/2021	263.87	332.70	-68.83	
		10/19/2021	263.87	350.00	-86.13	
		12/7/2021	263.87	338.00	-74.13	
	02N21W16J01S	3/9/2021	259.90	17.30	242.60	
		6/14/2021	259.90	17.52	242.38	
		10/19/2021	259.90	18.35	241.55	
		12/7/2021	259.90	18.00	241.90	
	02N21W18H03S	3/17/2021	118.41	107.90	10.51	
		6/15/2021	118.41	113.10	5.31	
		10/18/2021	118.41	115.40	3.01	
		12/6/2021	118.41	116.40	2.01	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Las Posas Valley – West Management Area	02N21W18H12S	3/17/2021	117.88	160.27	-42.39	
Las Posas Valley – West Management Area	02N21W18H12S	6/9/2021	117.88	183.30	-65.42	
Las Posas Valley – West Management Area	02N21W18H12S	10/18/2021	117.88	197.20	-79.32	
Las Posas Valley – West Management Area	02N21W18H12S	12/6/2021	117.88	189.05	-71.17	
Las Posas Valley – West Management Area	03N20W32H03S	3/9/2021	673.00	819.40	-146.40	
Las Posas Valley – West Management Area	03N20W32H03S	6/15/2021	673.00	822.60	-149.60	
Las Posas Valley – West Management Area	03N20W32H03S	10/18/2021	673.00	826.50	-153.50	
Las Posas Valley – West Management Area	03N20W32H03S	12/7/2021	673.00	832.70	-159.70	
Las Posas Valley – West Management Area	03N21W35P02S	3/22/2021	564.11	516.50	47.61	
Las Posas Valley – West Management Area	03N21W35P02S	6/14/2021	564.11	----	----	Pumping
Las Posas Valley – West Management Area	03N21W35P02S	10/20/2021	564.11	535.30	28.81	
Las Posas Valley – West Management Area	03N21W35P02S	12/7/2021	564.11	----	----	Pumping
Lockwood Valley	08N21W33R03S*	4/30/2021	5,150.00	57.20	5,092.80	
Lockwood Valley	08N21W33R03S*	9/28/2021	5,150.00	----	----	Pumping
Mound	02N22W09L03S	3/18/2021	251.25	199.25	52.00	
Mound	02N22W09L03S	6/14/2021	251.25	----	----	No site access
Mound	02N22W09L03S	10/11/2021	251.25	----	----	No site access
Mound	02N22W09L03S	12/7/2021	251.25	----	----	No site access
Mound	02N22W09L04S	3/18/2021	251.25	160.10	91.15	
Mound	02N22W09L04S	6/14/2021	251.25	----	----	No site access
Mound	02N22W09L04S	10/11/2021	251.25	----	----	No site access
Mound	02N22W09L04S	12/7/2021	251.25	----	----	No site access
Mound	02N22W16K01S	3/10/2021	149.37	164.54	-15.17	
Mound	02N22W16K01S	6/8/2021	149.37	172.40	-23.03	
Mound	02N22W16K01S	10/11/2021	149.37	178.40	-29.03	
Mound	02N22W16K01S	12/3/2021	149.37	181.17	-31.80	
Mound	02N23W13K03S	3/18/2021	68.71	----	----	No site access
Mound	02N23W13K03S	6/8/2021	68.71	75.50	-6.79	
Mound	02N23W13K03S	10/12/2021	68.71	84.80	-16.09	
Mound	02N23W13K03S	12/7/2021	68.71	77.90	-9.19	
Ojai Valley	04N22W04Q01S	3/26/2021	1,045.50	98.60	946.90	
Ojai Valley	04N22W04Q01S	6/28/2021	1,045.50	101.40	944.10	
Ojai Valley	04N22W04Q01S	10/6/2021	1,045.50	105.25	940.25	
Ojai Valley	04N22W04Q01S	12/15/2021	1,045.50	111.80	933.70	
Ojai Valley	04N22W05D03S	3/26/2021	895.97	172.50	723.47	
Ojai Valley	04N22W05D03S	6/25/2021	895.97	176.30	719.67	
Ojai Valley	04N22W05D03S	10/6/2021	895.97	207.90	688.07	
Ojai Valley	04N22W05D03S	12/15/2021	895.97	203.42	692.55	
Ojai Valley	04N22W05H04S	3/16/2021	950.22	197.20	753.02	
Ojai Valley	04N22W05H04S	6/25/2021	950.22	----	----	No site access
Ojai Valley	04N22W05H04S	10/26/2021	950.22	244.80	705.42	
Ojai Valley	04N22W05H04S	12/15/2021	950.22	237.74	712.48	
Ojai Valley	04N22W05L08S*	3/16/2021	892.09	196.40	695.69	
Ojai Valley	04N22W05L08S*	6/25/2021	892.09	200.80	691.29	
Ojai Valley	04N22W05L08S*	10/6/2021	892.09	192.50	699.59	
Ojai Valley	04N22W05L08S*	12/15/2021	892.09	204.80	687.29	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Ojai Valley	04N22W05M01S	3/26/2021	843.47	120.80	722.67	
		6/28/2021	843.47	123.30	720.17	
		10/26/2021	843.47	153.00	690.47	
		12/15/2021	843.47	164.10	679.37	
	04N22W06D01S	3/16/2021	846.66	89.30	757.36	
		6/25/2021	846.66	93.50	753.16	
		10/6/2021	846.66	125.00	721.66	
		12/16/2021	846.66	129.20	717.46	
	04N22W06D05S	3/26/2021	853.21	111.80	741.41	
		6/25/2021	853.21	115.20	738.01	
		10/6/2021	853.21	135.00	718.21	
		12/16/2021	853.21	139.80	713.41	
	04N22W06K03S	3/16/2021	801.80	112.90	688.90	
		6/25/2021	801.80	117.70	684.10	
		10/1/2021	801.80	142.66	659.14	
		12/3/2021	801.80	141.50	660.30	
	04N22W06K12S	3/16/2021	812.70	124.70	688.00	
		6/25/2021	812.70	125.10	687.60	
		10/6/2021	812.70	----	----	No Tape Access
		12/16/2021	812.70	----	----	No Tape Access
	04N22W06M01S	3/16/2021	794.78	71.20	723.58	
		6/25/2021	794.78	79.10	715.68	
		10/6/2021	794.78	91.20	703.58	
		12/16/2021	794.78	89.40	705.38	
	04N22W07B02S	3/26/2021	773.77	76.10	697.67	
		6/28/2021	773.77	78.90	694.87	
		10/26/2021	773.77	95.50	678.27	
		12/16/2021	773.77	97.50	676.27	
	04N22W07G01S	3/26/2021	771.20	37.20	734.00	
		6/28/2021	771.20	38.20	733.00	
		10/26/2021	771.20	77.00	694.20	
		12/16/2021	771.20	72.10	699.10	
	04N22W08B02S	3/26/2021	870.57	76.90	793.67	
		6/25/2021	870.57	82.30	788.27	
		10/6/2021	870.57	154.50	716.07	
		12/15/2021	870.57	155.00	715.57	
	04N23W01K02S	3/26/2021	786.38	44.60	741.78	
		6/25/2021	786.38	46.60	739.78	
		10/26/2021	786.38	55.00	731.38	
		12/16/2021	786.38	57.60	728.78	
	04N23W02K01S	3/16/2021	869.49	77.80	791.69	
		6/25/2021	869.49	81.10	788.39	
		10/28/2021	869.49	----	----	Could Not Read Tape
		12/16/2021	869.49	166.00	703.49	
	04N23W12H02S	3/26/2021	716.61	32.10	684.51	
		6/28/2021	716.61	32.90	683.71	
		10/28/2021	716.61	43.00	673.61	
		12/16/2021	716.61	40.60	676.01	
	05N22W32J02S	3/2/2021	682.50	----	----	No Site Access
		6/23/2021	682.50	----	----	No Site Access
		9/30/2021	682.50	----	----	No Site Access
		12/15/2021	682.50	----	----	No Site Access

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Oxnard – Forebay Management Area	02N21W07P04S	3/9/2021	138.78	----	----	No site access
		6/15/2021	138.78	191.40	-52.62	
		10/26/2021	138.78	191.50	-52.72	
		12/6/2021	138.78	----	----	Pumping
	02N22W26E01S	3/22/2021	86.96	92.76	-5.80	
		6/14/2021	86.96	----	----	No site access
		10/20/2021	86.96	103.56	-16.56	
		12/8/2021	86.96	106.39	-19.43	
Oxnard	01N21W04N02S	3/9/2021	43.33	127.42	-84.09	
		6/9/2021	43.33	141.65	-98.32	
		10/13/2021	43.33	162.70	-119.37	
		12/2/2021	43.33	159.70	-116.37	
	01N21W06L04S	3/9/2021	47.85	58.00	-10.15	
		6/9/2021	47.85	65.25	-17.40	
		10/13/2021	47.85	----	----	Tape Hangs Up
		12/6/2021	47.85	----	----	Tape Hangs Up
	01N21W07H01S*	3/9/2021	40.87	48.08	-7.21	
		6/9/2021	40.87	52.80	-11.93	
		10/13/2021	40.87	55.00	-14.13	
		12/6/2021	40.87	52.38	-11.51	
	01N21W08N03S	3/9/2021	31.50	113.17	-81.67	
		6/9/2021	31.50	126.70	-95.20	
		10/12/2021	31.50	146.97	-115.47	
		12/6/2021	31.50	137.31	-105.81	
	01N21W09C04S	3/9/2021	39.96	100.20	-60.24	
		6/9/2021	39.96	106.42	-66.46	
		10/13/2021	39.96	122.35	-82.39	
		12/2/2021	39.96	117.02	-77.06	
	01N21W16A04S	3/9/2021	25.69	109.20	-83.51	
		6/16/2021	25.69	124.30	-98.61	
		10/12/2021	25.69	137.00	-111.31	
		12/6/2021	25.69	130.60	-104.91	
	01N21W16M01S	3/9/2021	22.79	113.40	-90.61	
		6/16/2021	22.79	126.05	-103.26	
		10/12/2021	22.79	146.95	-124.16	
		12/6/2021	22.79	134.70	-111.91	
	01N21W16P03S	3/9/2021	19.39	113.01	-93.62	
		6/16/2021	19.39	123.80	-104.41	
		10/12/2021	19.39	137.35	-117.96	
		12/6/2021	19.39	130.16	-110.77	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Oxnard	01N21W17D02S	3/9/2021	28.21	----	----	Pumping
		6/9/2021	28.21	40.1	-11.9	
		10/12/2021	28.21	43.10	-14.89	
		12/6/2021	28.21	----	----	Pumping
	01N21W21N01S	3/9/2021	15.74	71.5	-55.8	
		6/16/2021	15.74	95.6	-79.8	
		10/12/2021	15.74	98.8	-83.1	
		12/6/2021	15.74	99.4	-83.6	
	01N21W28D01S	3/9/2021	14.75	89.8	-75.0	
		6/16/2021	14.75	----	----	Pumping
		10/18/2021	14.75	123.0	-108.3	
		12/6/2021	14.75	110.3	-95.6	
	01N21W29B03S	3/17/2021	18.19	26.5	-8.3	
		6/16/2021	18.19	----	----	Pumping
		10/12/2021	18.19	----	----	Pumping
		12/6/2021	18.19	31.6	-13.4	
	01N21W32K01S*	3/15/2021	10.00	74.0	-64.0	
		6/14/2021	10.00	88.3	-78.3	
		10/18/2021	10.00	103.8	-93.8	
		12/15/2021	10.00	----	----	Not Measured
	01N22W12N03S	3/9/2021	38.46	----	----	No measure port
		6/9/2021	38.46	----	----	No measure port
		10/13/2021	38.46	----	----	No measure port
		12/6/2021	38.46	----	----	No measure port
	01N22W12R01S	3/9/2021	34.00	89.2	-55.2	
		6/9/2021	34.00	89.2	-55.2	
		10/13/21	34.00	----	----	No site access
		12/6/21	34.00	102.9	-68.9	
	01N22W14K01S	3/9/21	33.97	----	----	Tape hangs up
		6/16/21	33.97	----	----	Tape hangs up
		10/12/21	33.97	----	----	Tape hangs up
		12/6/21	33.97	----	----	Tape hangs up
	01N22W21B03S	3/9/21	15.28	36.5	-21.2	
		6/8/21	15.28	----	----	No site access
		10/12/21	15.28	----	----	No site access
		12/7/21	15.28	----	----	No site access
	01N22W24C02S	3/9/21	29.10	39.3	-10.2	
		6/16/21	29.10	41.1	-12.0	
		10/12/21	29.10	43.9	-14.8	
		12/6/21	29.10	45.4	-16.3	
	01N22W26K03S	3/10/21	13.06	66.5	-53.5	
		6/16/21	13.06	----	----	Pumping
		10/12/21	13.06	98.2	-85.1	
		12/6/21	13.06	85.3	-72.2	
	01N22W26M03S	3/9/2021	13.00	63.20	-50.20	
		6/16/2021	13.00	----	----	Pumping
		10/12/2021	13.00	88.30	-75.30	
		12/6/2021	13.00	79.80	-66.80	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Oxnard	01N22W26M03S	3/9/2021	11.50	66.17	-54.67	
		6/16/2021	11.50	0.00	11.50	Pumping
		10/12/2021	11.50	98.20	-86.70	Pumping
		12/6/2021	11.50	0.00	11.50	
	01N22W36B02S	3/10/2021	102.70	142.67	-39.97	
		6/9/2021	102.70	141.83	-39.13	Pumping
		10/19/2021	102.70	158.16	-55.46	Pumping
		12/7/2021	102.70	150.37	-47.67	Pumping
	02N21W19A03S	3/10/2021	101.80	116.68	-14.88	
		6/9/2021	101.80	120.30	-18.50	
		10/18/2021	101.80	122.20	-20.40	
		12/7/2021	101.80	115.85	-14.05	
	02N21W19B02S	3/10/2021	113.36	187.20	-73.84	
		6/9/2021	113.36	181.20	-67.84	
		10/19/2021	113.36	203.56	-90.20	
		12/7/2021	113.36	199.40	-86.04	
	02N21W20F02S	3/17/2021	92.09	167.00	-74.91	No site access
		6/9/2021	92.09	0.00	92.09	No site access
		10/18/2021	92.09	0.00	92.09	No site access
		12/7/2021	92.09	181.07	-88.98	
	02N21W20M06S	3/9/2021	57.75	63.37	-5.62	
		6/9/2021	57.75	67.07	-9.32	
		10/13/2021	57.75	70.80	-13.05	Pumping
		12/6/2021	57.75	71.25	-13.50	Pumping
	02N21W31P02S	3/9/2021	55.17	114.15	-58.98	
		6/9/2021	55.17	126.50	-71.33	
		10/13/2021	55.17	165.10	-109.93	
		12/6/2021	55.17	154.23	-99.06	
	02N21W31P03S	3/10/2021	94.30	0.00	94.30	
		6/9/2021	94.30	0.00	94.30	
		10/18/2021	94.30	122.60	-28.30	
		12/7/2021	94.30	125.06	-30.76	
	02N22W24P01S	3/10/2021	42.38	52.47	-10.09	
		6/8/2021	42.38	59.15	-16.77	Pumping
		10/12/2021	42.38	66.52	-24.14	Pumping
		12/7/2021	42.38	63.85	-21.47	
	02N22W30K01S	3/10/2021	42.30	0.00	42.30	
		6/8/2021	42.30	56.83	-14.53	
		10/12/2021	42.30	64.40	-22.10	
		12/7/2021	42.30	63.09	-20.79	
	02N22W31A01S	3/10/2021	40.10	0.00	40.10	
		6/8/2021	40.10	0.00	40.10	
		10/12/2021	40.10	0.00	40.10	
		12/7/2021	40.10	0.00	40.10	
	02N22W32Q03S	3/10/2021	23.22	0.00	23.22	
		6/8/2021	23.22	0.00	23.22	No site access
		10/12/2021	23.22	0.00	23.22	No site access
		12/7/2021	23.22	0.00	23.22	Pumping

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Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Piru	04N18W19R01S	3/18/2021	655.63	101.60	554.03	
		6/14/2021	655.63	115.33	540.30	
		10/11/2021	655.63	125.70	529.93	
		12/3/2021	655.63	138.00	517.63	
	04N18W30J05S	3/18/2021	623.30	61.85	561.45	
		6/14/2021	623.30	71.50	551.80	Pumping
		10/11/2021	623.30	92.15	531.15	
		12/3/2021	623.30	98.32	524.98	
	04N19W25C02S*	3/18/2021	611.09	79.20	531.89	
		6/14/2021	611.09	83.00	528.09	
		10/11/2021	611.09	93.90	517.19	
		12/3/2021	611.09	98.10	512.99	
	04N19W25K04S	3/18/2021	593.97	----	----	Pumping
		6/14/2021	593.97	----	----	Pumping
		10/11/2021	593.97	----	----	Pumping
		12/3/2021	593.97	76.38	517.59	
	04N19W26P01S	3/18/2021	563.00	40.17	522.83	
		6/14/2021	563.00	----	----	Pumping
		10/11/2021	563.00	----	----	Pumping
		12/3/2021	563.00	----	----	Pumping
	04N19W34K01S	3/18/2021	519.51	14.67	504.84	
		6/14/2021	519.51	----	----	No site access
		10/11/2021	519.51	----	----	No site access
		12/3/2021	519.51	----	----	No site access
	04N19W35L02S	3/18/2021	541.08	21.20	519.88	No site access
		6/14/2021	541.08	28.20	512.88	
		10/11/2021	541.08	34.80	506.28	
		12/3/2021	541.08	37.90	503.18	
Pleasant Valley	01N21W01M02S	3/9/2021	96.17	189.16	-92.99	
		6/10/2021	96.17	204.70	-108.53	
		10/12/2021	96.17	211.60	-115.43	
		12/6/2021	96.17	209.95	-113.78	
	01N21W02J02S	3/9/2021	89.51	97.40	-7.89	
		6/10/2021	89.51	98.37	-8.86	
		10/12/2021	89.51	107.80	-18.29	
		12/6/2021	89.51	107.53	-18.02	
	01N21W02P01S	3/9/2021	67.98	----	----	Capped
		6/10/2021	67.98	----	----	Capped
		10/12/2021	67.98	----	----	Capped
		12/6/2021	67.98	----	----	Capped
	01N21W03C01S*	3/9/2021	72.28	157.30	-85.02	
		6/10/2021	72.28	184.70	-112.42	
		10/12/2021	72.28	179.30	-107.02	
		12/2/2021	72.28	192.10	-119.82	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Pleasant Valley	01N21W04K01S	3/9/2021	47.52	135.90	-88.38	
		6/16/2021	47.52	151.50	-103.98	
		10/18/2021	47.52	166.80	-119.28	
		12/6/2021	47.52	157.80	-110.28	
	01N21W09J03S	3/30/2021	30.56	113.20	-82.64	
		6/9/2021	30.56	----	----	No site access
		10/13/2021	30.56	----	----	No site access
		12/2/2021	30.56	----	----	No site access
	01N21W10G01S	3/9/2021	38.72	128.42	-89.70	
		6/16/2021	38.72	----	----	Pumping
		10/18/2021	38.72	169.00	-130.28	
		12/6/2021	38.72	153.95	-115.23	
	01N21W14A01S	3/9/2021	50.11	22.65	27.46	
		6/10/2021	50.11	24.70	25.41	
		10/12/2021	50.11	27.45	22.66	
		12/6/2021	50.11	26.05	24.06	
	01N21W15H01S	3/9/2021	33.17	15.53	17.64	
		6/10/2021	33.17	16.33	16.84	
		10/12/2021	33.17	19.55	13.62	
		12/6/2021	33.17	18.75	14.42	
	02N20W19M05S	3/17/2021	200.47	196.20	4.27	
		6/10/2021	200.47	185.16	15.31	
		10/13/2021	200.47	188.15	12.32	
		12/2/2021	200.47	187.90	12.57	
	02N21W35M02S	3/9/2021	90.60	176.45	-85.85	
		6/10/2021	90.60	192.20	-101.60	
		10/12/2021	90.60	200.60	-110.00	
		12/6/2021	90.60	197.89	-107.29	
	02N21W36N01S	3/9/2021	111.18	104.33	6.85	
		6/10/2021	111.18	106.70	4.48	
		10/12/2021	111.18	117.42	-6.24	
		12/6/2021	111.18	114.95	-3.77	
Santa Paula	02N22W03K02S	3/18/2021	248.75	129.94	118.81	
		6/8/2021	248.75	127.70	121.05	
		10/11/2021	248.75	133.20	115.55	
		12/3/2021	248.75	134.52	114.23	
	02N22W03M02S	3/18/2021	291.50	202.74	88.76	
		6/8/2021	291.50	201.90	89.60	
		10/11/2021	291.50	202.96	88.54	
		12/3/2021	291.50	205.34	86.16	
	02N22W09K02S	3/18/2021	362.18	167.04	195.14	
		6/14/2021	362.18	173.10	189.08	
		10/11/2021	362.18	176.30	185.88	
		12/3/2021	362.18	175.99	186.19	
	03N21W17Q01S	3/18/2021	283.35	105.75	177.60	
		6/14/2021	283.35	0.00	283.35	
		10/11/2021	283.35	106.10	177.25	
		12/3/2021	283.35	105.75	177.60	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Santa Paula	03N21W19R01S	3/18/2021	235.39	78.48	156.91	
		6/14/2021	235.39	----	----	Pumping
		10/11/2021	235.39	93.20	142.19	
		12/3/2021	235.39	91.69	143.70	
	03N21W30F01S	3/18/2021	221.21	71.67	149.54	
		6/14/2021	221.21	----	----	Pumping
		10/11/2021	221.21	76.25	144.96	
		12/3/2021	221.21	----	----	Pumping
	03N21W36K05S	3/18/2021	180.89	43.75	137.14	
		6/8/2021	180.89	45.37	135.52	
		10/11/2021	180.89	48.83	132.06	
		12/3/2021	180.89	45.45	135.44	
Simi Valley	02N18W04R02S	3/17/2021	870.00	54.80	815.20	
		6/10/2021	870.00	55.80	814.20	
		10/13/2021	870.00	55.70	814.30	
		12/2/2021	870.00	56.40	813.60	
	02N18W10A02S	3/26/2021	926.40	92.80	833.60	
		06/25/2021	926.40	90.70	835.70	
		9/24/2021	926.40	92.80	833.60	
		12/3/2021	926.40	91.70	834.70	
Tierra Rejada	02N19W10R01S	3/17/2021	619.29	163.52	455.77	
		6/10/2021	619.29	165.20	454.09	
		10/13/2021	619.29	169.66	449.63	
		12/2/2021	619.29	170.75	448.54	
	02N19W12M03S	3/17/2021	718.95	101.80	617.15	
		6/10/2021	718.95	102.80	616.15	
		10/13/2021	718.95	105.70	613.25	
		12/2/2021	718.95	104.10	614.85	
	02N19W14P01S	3/17/2021	678.12	----	----	No site access
		6/10/2021	678.12	----	----	No site access
		10/13/2021	678.12	----	----	No site access
		12/2/2021	678.12	36.23	641.89	No site access

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
UNDEFINED	01N19W02L01S	3/4/2021	945.42	----	----	No site access
		6/30/2021	945.42	102.30	843.12	
		10/5/2021	945.42	52.80	892.62	
		12/27/2021	945.42	56.00	889.42	
	01N19W14K04S	3/4/2021	908.79	22.90	885.89	
		6/30/2021	908.79	19.20	889.59	
		10/5/2021	908.79	24.30	884.49	
		12/20/2021	908.79	24.00	884.79	
	01N19W15E01S	3/4/2021	903.53	26.80	876.73	
		6/30/2021	903.53	23.80	879.73	
		10/5/2021	903.53	28.20	875.33	
		12/20/2021	903.53	29.00	874.53	
	01N20W24H02S	3/4/2021	1,126.54	----	----	too much rust
		6/30/2021	1,126.54	----	----	too much rust
		10/5/2021	1,126.54	----	----	Dry
		12/20/2021	1,126.54	----	----	Dry
	04N22W10K02S	3/3/2021	1,325.90	26.50	1,299.40	
		6/25/2021	1,325.90	28.80	1,297.10	
		10/1/2021	1,325.90	28.00	1,297.90	
		12/15/2021	1,325.90	26.50	1,299.40	
	04N22W21F01S	10/28/2021	2,570.00	----	----	Tape Hung Up
		12/16/2021	2,570.00	148.00	2,422.00	
	04N22W22K01S	10/28/2021	2,400.00	245.25	2,154.75	
		12/16/2021	2,400.00	245.06	2,154.94	
	04N23W14M04S	3/1/2021	554.50	----	----	Flowing
		6/23/2021	554.50	----	----	Flowing
		10/1/2021	554.50	----	----	Flowing
		12/10/2021	554.50	----	----	Flowing
	04N23W16P01S	3/2/2021	619.89	73.40	546.49	
		6/23/2021	619.89	73.70	546.19	
		9/30/2021	619.89	74.30	545.59	
		12/10/2021	619.89	----	----	Tape Hung Up
	04N23W28G01S	3/2/2021	402.37	30.30	372.07	
		6/25/2021	402.37	34.20	368.17	
		9/30/2021	402.37	----	----	Dry
		12/10/2021	402.37	----	----	Dry
	04N23W33M03S	3/1/2021	331.80	24.70	307.10	
		6/23/2021	331.80	25.90	305.90	
		9/29/2021	331.80	23.00	308.80	
		12/10/2021	331.80	23.70	308.10	
	04N24W13J04S	3/1/2021	626.45	6.10	620.35	
		6/23/2021	626.45	10.20	616.25	
		9/29/2021	626.45	14.25	612.20	
		12/10/2021	626.45	14.00	612.45	
	04N24W13N01S	3/1/2021	642.12	2.50	639.62	
		6/23/2021	642.12	4.60	637.52	
		9/29/2021	642.12	5.55	636.57	
		12/10/2021	642.12	4.70	637.42	

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Upper Ojai Valley	04N22W09Q02S	3/3/2021	1,278.80	20.90	1,257.90	
		6/25/2021	1,278.80	23.60	1,255.20	
		10/1/2021	1,278.80	26.00	1,252.80	
		12/15/2021	1,278.80	26.20	1,252.60	
	04N22W11P02S	3/3/2021	1,420.60	20.30	1,400.30	
		6/25/2021	1,420.60	23.30	1,397.30	
		10/26/2021	1,420.60	32.50	1,388.10	
		12/15/2021	1,420.60	33.50	1,387.10	
	04N22W12F04S	3/3/2021	1,616.90	134.20	1,482.70	
		6/25/2021	1,616.90	149.80	1,467.10	
		10/1/2021	1,616.90	160.00	1,456.90	
		12/15/2021	1,616.90	160.70	1,456.20	
Ventura River - Lower	03N23W32Q03S	3/26/2021	50.86	36.30	14.56	
		6/25/2021	50.86	33.60	17.26	
		10/1/2021	50.86	31.70	19.16	
		12/10/2021	50.86	35.20	15.66	
	03N23W32Q07S	3/26/2021	46.10	36.90	9.20	
		6/25/2021	46.10	33.20	12.90	
		10/1/2021	46.10	26.40	19.70	
		12/10/2021	46.10	26.30	19.80	
Ventura River - Upper	03N23W05B01S	3/1/2021	293.20	45.50	247.70	
		6/23/2021	293.20	46.60	246.60	
		9/29/2021	293.20	47.30	245.90	
		12/10/2021	293.20	47.80	245.40	
	03N23W08B07S	3/1/2021	239.19	13.80	225.39	
		6/23/2021	239.19	0.00	239.19	
		9/30/2021	239.19	14.70	224.49	
		12/10/2021	239.19	15.10	224.09	
	04N23W03M01S	3/2/2021	760.85	----	----	No site access
		6/23/2021	760.85	----	----	No site access
		9/30/2021	760.85	104.50	656.35	
		12/10/2021	760.85	105.80	655.05	No site access
	04N23W04J01S	3/2/2021	713.04	----	----	No site access
		6/29/2021	713.04	----	----	No site access
		9/23/2021	713.04	73.00	640.04	
		12/15/2021	713.04	65.50	647.54	
	04N23W09B01S	3/2/2021	662.30	46.30	616.00	
		6/29/2021	662.30	38.10	624.20	
		9/30/2021	662.30	62.80	599.50	
		12/10/2021	662.30	59.60	602.70	
	04N23W15A02S	3/2/2021	680.90	96.60	584.30	
		6/29/2021	680.90	98.80	582.10	
		9/30/2021	680.90	93.40	587.50	
		12/10/2021	680.90	93.60	587.30	
	04N23W15D02S	3/2/2021	634.30	128.90	505.40	
		6/23/2021	634.30	132.20	502.10	
		9/30/2021	634.30	121.05	513.25	
		12/15/2021	634.30	149.00	485.30	

* - Denotes basin key water level well.

Appendix C – Groundwater Level Measurement Data

GW Basin/Subbasin	SWN	Date	RP	Depth	Elev.	NMC
Ventura River - Upper	04N23W16C04S	3/2/2021	569.10	44.70	524.40	
		6/23/2021	569.10	63.20	505.90	
		9/30/2021	569.10	73.70	495.40	
		12/10/2021	569.10	----	----	Tape Hung Up
	04N23W20A01S	3/1/2021	488.89	27.80	461.09	
		6/23/2021	488.89	28.60	460.29	
		9/29/2021	488.89	----	----	No site access
		12/10/2021	488.89	----	----	No site access
	04N23W29F02S	3/1/2021	396.58	32.30	364.28	
		6/23/2021	396.58	32.70	363.88	
		9/29/2021	396.58	56.10	340.48	
		12/10/2021	396.58	68.50	328.08	
	05N23W33B03S	3/26/2021	829.00	----	----	No site access
		6/29/2021	829.00	----	----	Pumping
		9/23/2021	829.00	35.35	793.65	
		12/15/2021	829.00	26.30	802.70	
	05N23W33G01S	3/2/2021	816.21	69.20	747.01	
		6/29/2021	816.21	34.70	781.51	
		9/29/2021	816.21	----	----	Pumping
		12/15/2021	816.21	20.50	795.71	

* - Denotes basin key water level well.

Appendix D – Water Quality Section

TABLES Page

General Minerals Table D-1			
Mineral	Abbreviation	Reported Units	Laboratory Analytical Method
Boron	B	mg/l	EPA 200.7
Bicarbonate	HCO_3^-	mg/l	SM23320B
Calcium	Ca	mg/l	EPA 200.7
Copper	Cu	µg/l	EPA 200.7
Carbonate	CO_3^{2-}	mg/l	SM23320B
Chloride	Cl^-	mg/l	EPA 300.0
Electrical Conductivity	eC	µmhos/cm	SM2510B
Fluoride	F^-	mg/l	EPA 300.0
Iron	Fe	µg/l	EPA 200.7
Potassium	K	mg/l	EPA 200.7
Magnesium	Mg	mg/l	EPA 200.7
Manganese	Mn	µg/l	EPA 200.7
Nitrate	NO_3^-	mg/l	SM4500NO3F
Sodium	Na	mg/l	EPA 200.7
Sulfate	SO_4^{2-}	mg/l	EPA 300.0
Total Dissolved Solids	TDS	mg/l	EPA 200.7
Zinc	Zn	µg/l	EPA 200.7
pH	pH	units	SM4500-H B

Table D-1 General Minerals

GW Basin/Subbasin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Arroyo Santa Rosa Valley	02N19W19P02S	10/4/2021	0.2	340	65	ND	108	ND	1170	0.2	ND	1	65	20	63.1	71	111	760	ND	7.1
	02N19W20L01S	12/1/2021	0.2	420	93	ND	104	ND	1450	0.2	50	1	83	10	74.5	74	175	950	ND	7.1
	02N19W20M04S	10/4/2021	0.1	380	74	ND	137	ND	1290	0.3	ND	3	77	ND	25.9	69	128	800	ND	7.3
	02N20W23G03S	11/18/2021	0.1	320	71	ND	132	ND	1310	0.2	ND	2	78	ND	87.4	81	95	800	ND	7.0
	02N20W23R01S	10/4/2021	0.3	300	90	ND	179	ND	1530	0.2	ND	1	71	ND	80.8	123	200	1010	ND	7.0
	02N20W24M02S	10/4/2021	0.2	310	48	ND	215	ND	1360	0.3	ND	3	56	30	6.1	132	76.2	820	ND	7.4
	02N20W26C02S	10/4/2021	0.3	350	97	ND	169	ND	1600	0.3	ND	1	75	ND	74.2	118	218	1060	ND	7.0
Carpinteria	04N25W25N06S	10/21/2021	0.3	420	123	ND	108	ND	1570	0.3	ND	2	55	ND	27.5	95	319	1090	ND	7.2
	04N25W35G01S	10/21/2021	0.3	410	147	ND	107	ND	1490	0.3	ND	2	52	ND	27.7	94	314	1100	ND	7.1
Conejo	01N19W08G02S	9/23/2021	0.1	370	130	ND	133	ND	1830	0.2	ND	3	103	110	ND	101	478	1350	ND	7.6
Cuddy Ranch Area	08N20W04N02S	11/12/2021	ND	320	66	ND	15	ND	590	0.2	ND	2	9	ND	1.7	44	18	350	ND	7.0
Cuyama Valley	07N23W15P01S	10/27/2021	0.2	210	224	ND	8	ND	2460	1.1	ND	3	98	ND	3.4	78	1020	2090	ND	7.6
	08N24W17G02S	11/12/2021	0.4	280	15	ND	106	ND	1200	0.3	70	2	3	20	ND	232	206	740	ND	8.1
	09N23W30E05S	10/27/2021	0.7	350	87	ND	251	ND	1860	0.9	ND	3	16	ND	5.9	260	215	1100	ND	7.3
	09N24W33J03S	10/27/2021	0.4	310	77	ND	110	ND	1400	0.6	ND	3	13	ND	10.3	194	197	860	ND	7.6
Fillmore	03N20W01F05S	9/9/2021	0.5	280	139	ND	69	ND	1510	0.7	ND	5	51	ND	30.8	101	455	1130	ND	7.2
	03N20W09D01S	9/9/2021	0.8	330	204	ND	85	ND	1850	0.6	ND	6	68	ND	45.9	117	575	1430	ND	7.3
	03N21W01P08S	9/8/2021	0.3	340	193	ND	58	ND	1490	0.5	ND	3	52	650	52.6	85	369	1080	ND	5.1
	04N19W19N01S	9/8/2021	0.5	320	193	ND	42	ND	1590	0.7	ND	5	61	350	2.6	117	509	1220	ND	7.5
	04N19W31F01S	9/8/2021	0.6	260	144	ND	75	ND	1390	0.7	ND	6	57	ND	12.7	101	367	970	ND	7.4
	04N20W26D03S	9/9/2021	0.3	260	152	ND	51	ND	1170	0.5	ND	2	27	ND	44.7	51	285	820	ND	7.4
	04N20W31H04S	9/9/2021	ND	320	138	ND	19	ND	999	0.4	ND	2	32	ND	16.9	41	220	660	ND	7.1
	04N20W31P01S	9/9/2021	0.2	400	191	ND	50	ND	1450	0.5	ND	3	56	ND	76.2	73	332	1100	ND	7.0
	04N20W36P04S	9/9/2021	0.6	280	126	ND	63	ND	1400	0.6	ND	5	47	ND	15.8	99	378	980	160	7.1
Hidden Valley	01N19W19H03S	9/23/2021	0.1	340	61	ND	41	ND	859	0.1	ND	3	42	40	ND	54	109	520	ND	7.3
	01N19W29E04S	10/12/2021	ND	350	89	ND	59	ND	997	ND	ND	ND	29	ND	ND	61	144	580	ND	7.2
	01N20W25C01S	10/19/2021	ND	390	166	ND	118	ND	1540	0.1	ND	3	61	160	ND	72	287	1180	30	6.7
	01N20W25F04S	10/19/2021	0.1	250	23	ND	32	ND	568	ND	ND	ND	5	50	ND	101	36.6	350	120	7.7

Table D-1 General Minerals (cont.)

GW Basin/Subbasin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	Zn	pH
Las Posas Valley – East Las Posas Management Area	02N19W06F01S	11/22/2021	0.6	220	110	ND	127	30	1580	0.4	ND	4	41	20	16.3	138	345	1090	ND	7.2
	02N19W07B02S	10/22/2021	0.8	250	94	ND	148	ND	1840	0.6	ND	3	41	10	6.8	172	459	1240	ND	7.3
	02N19W07D02S	10/22/2021	0.6	240	124	ND	149	ND	1690	0.4	ND	3	32	ND	18.2	140	395	1160	ND	7.2
	02N19W08H02S	10/21/2021	0.6	230	128	ND	133	ND	1700	0.3	ND	4	38	ND	20.5	147	403	1170	60	7.1
	02N20W01B02S	11/22/2021	0.2	140	62	ND	88	ND	868	0.6	ND	4	25	110	ND	66	177	540	ND	7.2
	02N20W01Q01S	10/22/2021	0.7	290	144	ND	126	ND	1770	0.3	ND	3	37	ND	28	148	354	1210	ND	7.2
	02N20W01Q02S	10/22/2021	0.8	250	126	ND	154	ND	1960	0.5	ND	4	45	ND	13.9	194	512	1400	ND	7.2
	02N20W03H01S	11/17/2021	0.2	210	149	ND	78	ND	1180	0.2	ND	4	27	80	ND	55	278	860	ND	7.5
	02N20W04B01S	11/18/2021	0.1	200	73	ND	14	ND	692	0.3	ND	4	24	120	ND	40	148	450	ND	7.3
	02N20W04F01S	11/18/2021	0.1	220	175	ND	92	ND	1370	0.2	ND	6	46	450	ND	58	344	1080	ND	7.1
	02N20W04R03S	10/21/2021	0.4	260	202	ND	139	ND	1890	0.2	ND	5	37	ND	ND	117	511	1360	ND	7.1
	02N20W09Q05S	10/21/2021	0.7	270	173	ND	164	ND	2100	0.3	ND	6	57	30	11.6	182	565	1550	ND	7.2
	02N20W10D02S	11/22/2021	ND	200	80	ND	54	ND	767	0.2	ND	2	19	ND	35.9	37	98.1	470	20	7.7
	02N20W10G01S	10/22/2021	0.7	310	159	ND	158	ND	2050	0.2	ND	6	50	40	56.5	173	507	1470	30	7.2
	02N20W16B06S	10/22/2021	0.6	260	127	ND	165	ND	1930	0.4	ND	5	51	50	2.6	169	513	1330	ND	7.2
	03N19W28N03S	11/22/2021	0.9	310	118	ND	121	ND	1620	0.8	ND	5	37	30	ND	152	310	1070	ND	7.3
	03N19W29K06S	10/20/2021	ND	100	47	ND	42	ND	541	0.2	ND	ND	9	ND	73.5	29	37.2	450	ND	6.6
	03N19W29K08S	10/20/2021	ND	200	67	ND	28	ND	724	0.3	ND	2	16	ND	17.3	37	124	510	ND	7.0
	03N19W30E06S	10/20/2021	ND	160	44	ND	13	ND	457	0.2	ND	ND	9	ND	5.2	26	69.2	330	ND	7.2
	03N19W31B01S	11/17/2021	0.1	170	71	ND	26	ND	679	0.2	ND	3	13	20	ND	36	142	430	ND	7.2
	03N20W26H01S	11/17/2021	0.1	240	85	ND	61	ND	855	0.5	ND	3	23	ND	34.2	50	105	530	ND	7.1
	03N20W26R03S	10/20/2021	ND	210	79	ND	12	ND	745	0.2	ND	2	18	80	0.5	33	194	540	ND	7.4
	03N20W28J04S	10/20/2021	ND	280	72	ND	54	ND	932	0.5	ND	3	32	ND	64	65	120	630	ND	7.1
	03N20W34G01S	10/20/2021	ND	210	70	ND	11	ND	641	0.2	ND	3	18	160	ND	31	131	440	ND	7.2
	03N20W36P01S	11/19/2021	0.1	170	54	ND	20	ND	506	0.2	ND	2	11	ND	19	33	56	320	20	7.3
Las Posas Valley – West Las Posas Management Area	02N20W06R01S	11/17/2021	0.2	260	73	ND	16	ND	868	0.3	ND	5	26	100	ND	61	200	540	ND	7.5
	02N20W07R03S	11/9/2021	ND	180	62	ND	20	ND	594	0.3	ND	2	14	70	ND	35	115	370	ND	7.4
	02N20W08F01S	10/21/2021	ND	180	51	ND	13	ND	522	0.3	ND	2	12	100	ND	33	95.4	330	ND	7.6
	02N20W17L01S	10/4/2021	0.6	270	178	ND	156	ND	1900	0.3	ND	6	56	230	25.8	153	511	1370	20	6.9
	02N21W08H03S	10/20/2021	0.3	290	86	ND	68	ND	1160	0.3	ND	4	36	30	17.3	117	210	780	ND	7.3
	02N21W09N01S	10/21/2021	0.4	330	81	ND	66	ND	1380	0.2	ND	6	33	50	2.4	161	298	900	ND	7.6
	02N21W10G03S	10/20/2021	0.3	340	44	ND	50	ND	987	0.2	ND	5	20	40	2.7	116	154	640	ND	7.6
	02N21W10Q04S	11/19/2021	0.2	320	105	ND	35	ND	1160	0.2	ND	5	39	50	ND	80	250	790	ND	7.2
	02N21W11A02S	10/20/2021	0.2	240	189	ND	112	ND	1890	0.3	ND	3	64	ND	162	90	411	1480	ND	6.8
	02N21W11A03S	10/20/2021	ND	300	72	ND	33	ND	990	0.2	ND	5	31	ND	ND	72	197	620	ND	7.4
	02N21W12H02S	10/20/2021	ND	240	62	ND	51	ND	838	0.2	ND	4	22	ND	8.8	66	143	550	ND	7.3
	02N21W13A01S	10/22/2021	0.1	240	67	ND	15	ND	755	0.3	ND	3	19	50	ND	50	165	490	ND	7.6
	02N21W15M04S	10/21/2021	0.3	270	114	ND	85	ND	1470	0.2	ND	5	40	40	8.9	124	385	1050	ND	7.8
	02N21W16J03S	12/1/2021	0.3	280	78	ND	53	ND	1110	0.2	ND	5	30	50	ND	102	251	690	ND	7.6

Table D-1 General Minerals (cont.)

GW Basin/Subbasin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	Zn	pH
Las Posas Valley – West Las Posas Management Area	02N21W17F05S	11/9/2021	0.6	310	69	ND	64	ND	1480	0.2	ND	5	28	30	ND	202	361	950	ND	7.5
	02N21W17N03S	10/20/2021	0.4	290	109	ND	70	ND	1200	0.3	ND	4	36	170	14.9	117	257	820	ND	7.2
	02N21W18H01S	10/21/2021	0.4	310	240	ND	131	ND	2250	0.4	ND	7	83	ND	117	159	605	1730	ND	7.0
	02N21W18H14S	10/21/2021	0.3	310	89	ND	49	ND	1420	0.1	ND	7	39	50	ND	150	348	930	ND	7.5
	02N21W20A02S	12/1/2021	0.7	250	104	ND	45	ND	1300	ND	ND	6	36	50	0.2	102	382	890	ND	7.4
	02N21W28A02S	11/17/2021	0.4	290	88	ND	67	ND	1260	0.2	ND	6	34	30	ND	109	253	820	ND	7.3
	03N20W32K01S	11/9/2021	0.3	360	129	ND	25	ND	1430	0.3	ND	6	41	170	ND	109	395	1040	ND	7.0
	03N21W35P02S	11/9/2021	0.2	260	89	ND	85	ND	1180	0.4	ND	4	40	ND	67.3	91	217	780	ND	7.0
	03N21W36Q01S	10/20/2021	ND	280	77	ND	88	ND	1160	0.4	ND	3	42	ND	73	81	164	770	ND	7.1
Lockwood Valley	08N21W29N02S	11/12/2021	0.3	320	54	ND	6	ND	615	0.3	ND	3	20	ND	ND	46	56	390	ND	8.1
	08N21W29R07S	11/12/2021	13.4	360	45	ND	11	ND	1180	0.9	ND	2	10	ND	2	194	253	810	60	7.8
	08N21W33R03S	11/12/2021	0.8	240	86	ND	17	ND	777	0.5	ND	1	20	ND	6.9	44	187	510	ND	7.7
Mound	02N22W09K07S	9/14/2021	0.5	250	142	ND	77	ND	1650	0.2	ND	4	28	170	0.7	168	496	1230	30	7.4
	02N22W10N04S	9/14/2021	0.4	260	127	ND	48	ND	1380	0.4	ND	4	38	20	10.3	106	413	1020	ND	7.3
	02N23W13F02S	9/14/2021	0.6	400	130	ND	68	ND	1570	0.4	ND	4	35	280	ND	136	387	1130	ND	7.3
	02N23W13K03S	9/14/2021	0.6	360	130	ND	75	ND	1620	0.5	ND	4	39	260	ND	140	410	1140	ND	7.2
Ojai Valley	04N22W04P05S	11/10/2021	ND	270	110	ND	28	ND	963	0.4	ND	1	29	ND	31.7	39	226	680	ND	6.8
	04N22W04Q01S	11/10/2021	ND	240	104	ND	25	ND	940	0.3	ND	ND	29	ND	52.9	37	213	680	30	7.3
	04N22W05H04S	11/10/2021	ND	280	119	ND	19	ND	928	0.2	ND	2	28	ND	18.5	31	218	630	ND	6.9
	04N22W05M04S	11/10/2021	ND	320	127	ND	25	ND	1030	0.2	ND	2	32	ND	36.9	33	232	740	ND	6.8
	04N22W06J09S	11/10/2021	ND	270	121	ND	33	ND	969	0.2	ND	1	27	ND	31.8	37	218	670	ND	6.7
	04N22W06K14S	11/10/2021	0.6	290	118	ND	138	ND	1470	0.4	ND	1	25	160	21.8	133	210	910	ND	6.8
	04N23W01J03S	11/10/2021	ND	310	64	ND	24	ND	930	0.6	ND	ND	14	60	ND	119	179	560	ND	7.0
	04N23W01K02S	11/10/2021	ND	330	92	ND	29	ND	954	0.7	ND	ND	21	ND	ND	76	194	600	ND	6.8
	04N23W12B03S	11/10/2021	ND	300	162	ND	318	ND	1870	0.4	ND	2	33	950	ND	154	152	1220	ND	6.9
	05N22W32K02S	11/10/2021	ND	380	156	ND	49	ND	1230	0.4	ND	2	26	200	5.1	51	299	840	ND	6.9
	05N22W33J01S	11/10/2021	ND	350	191	ND	56	ND	1450	0.4	ND	2	40	290	ND	55	436	1120	ND	6.7
Oxnard – Forebay Management Area	02N21W07P04S	10/21/2021	0.5	300	147	ND	68	ND	1660	0.4	ND	6	55	110	ND	114	516	1240	ND	7.3
Oxnard	01N21W04D04S	11/18/2021	0.5	340	57	ND	107	ND	1320	0.3	ND	10	23	30	ND	173	178	790	ND	7.4
	01N21W07H05S	11/15/2021	0.7	250	171	ND	99	ND	1660	0.5	ND	4	50	400	ND	104	433	1200	ND	7.0
	01N21W08R01S	11/18/2021	0.4	280	85	ND	68	ND	1120	0.3	ND	6	32	30	ND	121	201	750	ND	7.4
	01N21W17B02S	11/15/2021	0.5	270	89	ND	44	ND	1190	0.2	ND	7	33	70	ND	114	265	780	ND	7.3
	01N21W20B01S	11/15/2021	0.6	260	95	ND	46	ND	1130	0.2	ND	6	35	60	ND	92	257	790	ND	7.3
	01N21W21H02S	11/18/2021	0.5	280	72	ND	100	ND	1340	0.2	ND	6	39	20	ND	158	217	820	ND	7.3

Table D-1 General Minerals (cont.)

GW Basin/Subbasin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	Zn	pH
Oxnard	01N21W21K03S	11/5/2021	0.4	250	65	ND	57	ND	1040	0.2	ND	6	37	60	ND	111	202	690	ND	8.3
	01N21W22C01S	11/18/2021	0.3	260	73	ND	65	ND	967	0.2	ND	3	30	100	ND	97	170	610	ND	7.4
	01N21W28H03S	11/5/2021	0.6	350	80	ND	160	ND	1490	0.2	ND	5	45	50	ND	168	191	880	ND	8.0
	01N21W29B03S	12/1/2021	0.5	290	131	ND	108	ND	1480	0.3	ND	4	48	860	0.2	113	322	1040	ND	7.1
	01N21W33A01S	11/5/2021	0.4	290	153	ND	221	ND	1730	0.2	ND	4	48	400	ND	123	234	1110	ND	8.4
	01N22W06B01S	11/15/2021	1	300	194	ND	80	ND	1990	0.6	ND	6	67	ND	5.2	133	654	1550	ND	6.9
	01N22W06R02S	11/5/2021	0.9	270	198	ND	73	ND	1800	0.6	ND	5	63	20	4.1	117	570	1410	ND	8.3
	01N22W12Q03S	11/16/2021	0.7	240	132	ND	52	ND	1360	0.6	ND	4	39	170	ND	95	385	1020	ND	7.0
	01N22W23R02S	12/1/2021	0.6	240	119	ND	43	ND	1240	0.5	ND	5	38	110	0.2	84	310	890	ND	7.2
	01N22W24C03S	12/1/2021	0.6	230	123	ND	42	ND	1240	0.6	ND	4	39	110	ND	87	388	880	ND	7.1
	01N22W24M03S	12/1/2021	0.6	240	181	ND	240	ND	1880	0.5	ND	5	59	160	2.8	108	381	1280	ND	7.0
	01N22W25K01S	12/1/2021	0.6	230	530	ND	1230	ND	5600	ND	ND	12	154	1420	1.4	323	466	5130	ND	7.1
	01N22W25K02S	12/1/2021	0.6	250	93	ND	38	ND	1110	0.4	ND	4	41	70	ND	87	265	800	ND	7.5
	01N22W26K03S	12/1/2021	0.4	250	103	ND	43	ND	1160	0.2	ND	6	36	90	0.2	93	292	830	ND	7.4
	01N22W26M03S	12/1/2021	0.4	250	115	ND	43	ND	1230	0.2	ND	6	35	160	0.3	92	297	870	40	7.6
	01N22W26P02S	12/1/2021	0.4	250	77	ND	40	ND	1120	0.2	ND	6	37	10	0.2	95	254	780	ND	7.5
	01N22W26R04S	11/15/2021	0.7	240	160	ND	149	ND	1550	0.5	ND	4	46	290	ND	92	314	1160	ND	7.2
	01N22W36B02S	11/15/2021	0.6	310	100	ND	114	ND	1320	0.3	ND	7	36	90	ND	121	222	850	ND	7.4
	02N21W20Q05S	10/20/2021	0.6	290	114	ND	73	ND	1390	0.3	ND	7	40	80	ND	143	341	970	ND	7.4
	02N21W30A02S	10/20/2021	0.5	240	118	ND	55	ND	1280	0.2	ND	4	43	90	3.6	114	346	920	ND	7.4
	02N22W19J03S	11/15/2021	0.7	260	143	ND	53	ND	1380	0.5	ND	4	42	150	ND	113	421	1050	ND	6.9
	02N22W19P01S	11/15/2021	0.6	280	205	ND	85	ND	1980	0.4	ND	5	55	350	23	157	630	1490	ND	6.8
	02N22W24P01S	10/20/2021	0.6	240	141	ND	51	ND	1300	0.6	ND	4	50	ND	21.2	88	393	1000	ND	7.1
	02N22W24P02S	10/20/2021	0.6	240	142	ND	50	ND	1320	0.7	ND	5	49	ND	9.6	97	411	980	ND	7.2
	02N22W30F03S	11/5/2021	0.7	250	135	ND	47	ND	1300	0.6	ND	5	44	200	ND	109	408	920	ND	8.2
	02N22W31B01S	11/5/2021	0.8	240	151	ND	55	ND	1420	0.7	ND	5	53	ND	23.8	112	393	1060	ND	8.2
	02N22W31D02S	11/5/2021	0.8	250	144	ND	51	ND	1410	0.6	ND	5	49	290	13.8	103	446	1040	ND	8.4
	02N22W32C04S	11/5/2021	0.8	260	154	ND	59	ND	1440	0.6	ND	5	51	ND	36.9	93	408	1110	ND	8.4
	02N23W25M01S	11/15/2021	0.6	260	139	ND	54	ND	1440	0.4	ND	4	38	310	1.4	118	424	1050	ND	7.1
Piru	04N18W30J04S	9/14/2021	0.5	250	85	ND	66	ND	1110	0.6	ND	5	30	ND	16.6	98	233	770	50	7.4
	04N19W25H01S	9/8/2021	0.7	350	241	ND	142	ND	2130	0.6	ND	8	75	ND	81.2	135	509	1540	20	7.2
	04N19W25M03S	9/8/2021	0.9	450	319	ND	73	30	2700	0.9	ND	6	144	740	39.7	177	1080	2370	ND	7.1
	04N19W26H01S	9/14/2021	0.6	300	149	ND	103	ND	1680	0.7	ND	5	57	ND	24.2	131	419	1230	ND	7.3
	04N19W26J03S	9/14/2021	0.5	260	108	ND	106	ND	1380	0.7	ND	5	38	ND	13.1	109	327	960	20	7.5
	04N19W34J04S	9/8/2021	0.6	240	126	ND	57	ND	1260	0.8	ND	5	51	ND	10.5	85	338	860	ND	7.4

Table D-1 General Minerals (cont.)

GW Basin/Subbasin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Pleasant Valley	01N21W01D08S	11/16/2021	ND	360	87	ND	192	ND	1690	0.2	ND	ND	60	20	ND	162	197	1120	ND	7.0
	01N21W01M02S	11/16/2021	0.3	370	66	ND	149	ND	1490	0.2	ND	6	60	40	ND	137	204	940	ND	7.3
	01N21W02H04S	11/16/2021	0.8	340	292	ND	183	ND	2940	0.2	ND	5	83	10	112	270	717	2200	ND	6.8
	01N21W02J01S	11/16/2021	1.7	390	496	ND	422	ND	5490	ND	ND	8	137	ND	239	532	1720	4710	ND	6.8
	01N21W03K01S	11/18/2021	0.6	330	126	ND	188	ND	1870	0.3	ND	6	38	ND	25.7	194	371	1190	ND	7.1
	01N21W03R01S	11/18/2021	0.7	310	261	ND	191	ND	2450	0.2	ND	6	84	20	31.5	206	587	1820	ND	6.9
	01N21W04K01S	11/18/2021	0.4	290	93	ND	96	ND	1360	0.3	ND	5	28	50	ND	151	238	870	ND	7.3
	01N21W04R02S	11/16/2021	0.3	240	115	ND	78	ND	1220	0.3	ND	3	32	110	18.7	87	248	820	ND	7.2
	01N21W10A02S	11/16/2021	0.5	280	321	ND	204	ND	2960	0.2	ND	4	89	1180	83.2	163	962	2400	20	6.9
	01N21W10G01S	11/18/2021	0.6	310	100	ND	147	ND	1490	0.2	ND	7	45	40	1.2	159	226	950	ND	7.3
	01N21W12D01S	12/1/2021	0.7	370	244	ND	325	ND	3420	ND	ND	5	117	90	ND	246	809	2460	ND	7.0
	01N21W15D02S	11/18/2021	0.5	260	209	ND	160	ND	2000	0.2	ND	5	68	170	5.2	157	474	1400	ND	7.0
	01N21W15H01S	11/5/2021	2.2	160	456	ND	550	ND	5540	ND	680	8	180	2010	ND	643	1850	4620	ND	8.1
	02N20W19L05S	12/7/2021	0.7	270	200	ND	120	ND	2100	0.2	ND	5	61	190	1.5	201	586	1560	ND	7.6
	02N20W29B02S	10/4/2021	0.2	350	67	ND	122	ND	1270	0.3	ND	3	51	30	5.7	104	157	780	ND	7.2
	02N21W33R02S	12/2/2021	0.2	250	79	ND	61	ND	1030	0.3	ND	4	24	ND	0.2	87	207	670	ND	7.6
	02N21W34C01S	12/2/2021	0.3	270	77	ND	83	ND	1190	0.3	30	5	29	ND	0.2	103	279	770	ND	7.4
	02N21W34G01S	11/18/2021	0.8	370	91	ND	169	ND	1860	0.3	ND	7	30	20	ND	244	261	1180	ND	7.3
Santa Paula	02N22W03E01S	9/22/2021	0.5	380	289	ND	100	ND	2580	0.4	ND	5	76	440	1.4	176	939	2190	ND	7.0
	02N22W03K02S	9/22/2021	0.5	360	161	ND	71	ND	1570	0.3	ND	5	40	ND	5.2	133	412	1130	ND	7.3
	03N21W09K04S	9/13/2021	0.4	290	140	ND	45	ND	1310	0.4	ND	4	31	400	ND	107	358	940	ND	7.4
	03N21W17Q01S	9/13/2021	0.6	380	207	ND	82	ND	2050	0.5	ND	4	60	80	20	153	626	1570	ND	7.0
	03N21W21E11S	9/13/2021	0.7	340	200	ND	109	ND	1940	0.5	ND	5	56	320	ND	160	568	1440	ND	7.1
	03N21W30F01S	9/13/2021	0.6	400	224	ND	91	ND	2280	0.4	ND	4	54	210	1.5	135	729	1770	20	7.1
	03N22W35Q01S	9/22/2021	0.9	440	318	ND	104	ND	3110	0.4	50	6	87	690	38	271	1230	2630	ND	7.2
	03N22W36K07S	9/22/2021	0.4	330	237	ND	77	ND	1820	0.4	ND	4	54	160	0.7	93	614	1440	ND	7.3
Simi Valley	02N18W08D04S	11/10/2021	1.1	380	202	ND	165	ND	2310	0.4	ND	6	69	220	18.7	189	766	1720	ND	7.3
	02N18W08K07S	11/10/2021	1	310	273	ND	160	ND	2600	0.4	ND	5	78	ND	56.7	180	972	2070	ND	7.1
	02N18W09E01S	11/10/2021	0.9	300	206	ND	130	ND	2140	0.5	ND	5	68	ND	29.1	154	764	1630	ND	7.1
	02N18W10A02S	12/7/2021	1.1	320	244	ND	126	ND	2440	0.5	ND	6	87	ND	60.8	191	721	1930	ND	7.2

Table D-1 General Minerals (cont.)

GW Basin/Subbasin	SWN	Date	B	HCO_3^-	Ca	CO_3^{2-}	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Tierra Rejada	02N19W10R02S	11/9/2021	ND	260	52	ND	76	ND	963	0.3	ND	2	55	ND	9	61	174	680	ND	7.1
	02N19W11J03S	11/19/2021	0.2	250	63	ND	58	ND	1030	0.2	ND	1	47	ND	22.4	52	147	700	30	7.1
	02N19W14F01S	12/1/2021	0.1	360	83	ND	108	ND	1270	0.2	ND	1	72	ND	64.2	48	134	810	ND	6.8
	02N19W14Q02S	11/19/2021	ND	320	80	ND	50	ND	1110	0.6	ND	7	45	620	ND	76	203	720	ND	7.3
	02N19W15B01S	11/9/2021	ND	290	47	ND	81	ND	967	0.2	ND	2	57	ND	3	63	152	640	ND	7.5
	02N19W15J02S	11/9/2021	0.2	410	95	ND	176	ND	1840	0.2	ND	4	96	ND	34.4	121	334	1250	20	7.1
	02N19W15N03S	10/4/2021	ND	270	64	ND	80	ND	978	0.2	30	2	56	ND	0.9	48	164	700	ND	7.3
Upper Ojai Valley	04N22W10K05S	10/19/2021	0.4	480	167	ND	122	ND	1540	0.4	ND	1	41	1850	11.9	103	199	970	ND	7.4
	04N22W11J01S	10/14/2021	ND	200	72	ND	38	ND	720	0.4	ND	1	25	ND	53.4	37	90.8	450	ND	6.6
	04N22W11P02S	10/14/2021	ND	230	38	ND	14	ND	433	ND	30	1	12	320	ND	46	3	240	ND	7.5
Ventura River – Lower	02N23W05F01S	9/15/2021	0.6	490	72	ND	60	ND	1240	0.2	ND	7	24	70	ND	209	156	790	ND	7.8
	02N23W05K01S	9/15/2021	0.7	380	132	ND	115	ND	1570	0.6	ND	8	40	140	ND	147	321	1030	ND	7.2
	03N23W32Q08S	9/15/2021	0.8	380	214	ND	305	ND	2570	0.4	ND	8	67	270	ND	207	585	1860	ND	7.3
Ventura River – Upper	04N23W09G03S	9/17/2021	0.4	380	135	ND	90	ND	1250	0.3	ND	2	38	ND	37.7	62	195	810	ND	7.1
	04N23W15A02S	9/17/2021	0.4	200	49	ND	109	ND	998	0.8	ND	1	13	70	13.2	131	149	580	ND	7.0
	04N23W33M02S (Outside Basin)	9/17/2021	0.6	490	166	ND	144	ND	1870	0.3	ND	4	58	ND	ND	113	382	1350	ND	7.2
Gillibrand/Tapo	03N18W24C07S	11/10/2021	ND	290	157	ND	28	ND	1170	0.2	ND	3	33	ND	10.8	46	362	850	ND	7.3

California Title 22 Metals

Metals Table D-2			
Element Name	Element Symbol	Reported Units	Laboratory Analytical Method
Aluminum	Al	µg/l	EPA 200.8
Antimony	Sb	µg/l	EPA 200.8
Arsenic	As	µg/l	EPA 200.8
Barium	Ba	µg/l	EPA 200.8
Beryllium	Be	µg/l	EPA 200.8
Cadmium	Cd	µg/l	EPA 200.8
Chromium	Cr	µg/l	EPA 200.8
Lead	Pb	µg/l	EPA 200.8
Mercury	Hg	µg/l	EPA 245.1
Nickel	Ni	µg/l	EPA 200.8
Selenium	Se	µg/l	EPA 200.8
Silver	Ag	µg/l	EPA 200.8
Thallium	Tl	µg/l	EPA 200.8
Vanadium	V	µg/l	EPA 200.8

Radio Chemistry

Radio Chemistry Table D-3			
Name	Element Symbol	Reported Units	Laboratory Analytical Method
Gross Alpha		pCi/l	EPA 900.0
Uranium	U	pCi/l	EPA 908.0

Table D-2 Metals

GW Basin/Subbasin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Arroyo Santa Rosa Valley	02N19W19P02S	10/4/2021	ND	ND	ND	16	ND	ND	14	ND	ND	ND	ND	ND	ND	53
	02N20W23G03S	11/18/2021	ND	ND	4	35	ND	ND	19	ND	ND	2	8	ND	ND	70
Carpinteria	04N25W35G01S	10/21/2021	ND	ND	ND	26	ND	ND	ND	ND	ND	ND	17	ND	ND	ND
Conejo	01N19W08G02S	9/23/2021	ND	ND	ND	17	ND	ND	ND	ND	ND	2	3	ND	ND	ND
Cuddy Ranch Area	08N20W04N02S	11/12/2021	ND	ND	1	132	ND	ND	14	0.6	ND	2	1	ND	ND	6
Cuyama Valley	08N24W17G02S	11/12/2021	ND	ND	2	15	ND	ND	15	ND	ND	ND	2	ND	ND	5
Fillmore	03N21W01P08S	9/8/2021	ND	ND	ND	29	ND	ND	ND	ND	ND	3	13	ND	ND	ND
	04N19W19N01S	9/8/2021	ND	ND	ND	12	ND	ND	ND	ND	ND	3	20	ND	ND	ND
	04N19W31F01S	9/8/2021	ND	ND	1	18	ND	ND	ND	ND	ND	2	6	ND	ND	ND
	04N20W31H04S	9/9/2021	ND	ND	ND	26	ND	ND	ND	ND	ND	2	3	ND	ND	ND
Hidden Valley	01N19W19H03S	9/23/2021	ND	3	10	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	01N20W25C01S	10/19/2021	ND	ND	ND	48	ND	ND	ND	ND	ND	3	2	ND	ND	ND
	01N20W25F04S	10/19/2021	ND	3	3	113	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Las Posas Valley – East Las Posas Management Area	02N19W08H02S	10/21/2021	ND	ND	ND	13	ND	ND	ND	ND	ND	9	6	ND	ND	ND
	02N20W03H01S	11/17/2021	ND	ND	2	62	ND	ND	3	ND	ND	5	4	ND	ND	5
	02N20W04F01S	11/18/2021	ND	ND	ND	77	ND	ND	9	ND	ND	4	3	ND	ND	ND
	02N20W04R03S	10/21/2021	ND	ND	ND	41	ND	ND	ND	ND	ND	3	ND	ND	ND	5
	02N20W09Q05S	10/21/2021	ND	ND	3	25	ND	ND	ND	ND	ND	6	19	ND	ND	ND
	02N20W10D02S	11/22/2021	ND	ND	1	56	ND	ND	12	ND	ND	3	12	ND	ND	7
	02N20W10G01S	10/22/2021	ND	ND	ND	25	ND	ND	ND	ND	ND	6	13	ND	ND	ND
	02N20W16B06S	10/22/2021	ND	ND	ND	16	ND	ND	ND	ND	ND	7	4	ND	ND	ND
	03N19W28N03S	11/22/2021	ND	ND	6	28	ND	ND	3	ND	ND	5	5	ND	ND	5
	03N19W30E06S	10/20/2021	ND	ND	1	62	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	03N20W26H01S	11/17/2021	ND	ND	1	46	ND	ND	12	ND	ND	3	15	ND	ND	7
	03N20W34G01S	10/20/2021	ND	ND	ND	49	ND	ND	-5	ND	ND	ND	ND	ND	ND	ND
	03N20W36P01S	11/19/2021	ND	ND	3	61	ND	ND	10	ND	ND	2	5	ND	ND	12
Las Posas Valley – West Las Posas Management Area	02N20W06R01S	11/17/2021	ND	ND	ND	57	ND	ND	2	ND	ND	5	1	ND	ND	ND
	02N20W07R03S	11/9/2021	ND	ND	ND	66	ND	ND	8	ND	ND	1	ND	ND	ND	ND
	02N20W08F01S	10/21/2021	ND	ND	ND	58	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	02N21W08H03S	10/20/2021	ND	ND	1	45	ND	ND	ND	ND	ND	ND	23	ND	ND	3
	02N21W09N01S	10/21/2021	ND	ND	2	42	ND	ND	ND	ND	ND	ND	5	ND	ND	ND
	02N21W11A03S	10/20/2021	ND	ND	ND	41	ND	ND	-5	ND	ND	ND	2	ND	ND	ND
	02N21W15M04S	10/21/2021	ND	ND	2	30	ND	ND	-5	ND	ND	ND	14	ND	ND	ND
	02N21W17F05S	11/9/2021	ND	ND	6	27	ND	ND	16	ND	ND	2	3	ND	ND	5
	02N21W18H01S	10/21/2021	ND	ND	4	32	ND	ND	ND	ND	ND	ND	129	ND	ND	ND
	02N21W18H14S	10/21/2021	ND	ND	ND	38	ND	ND	ND	ND	ND	ND	3	ND	ND	ND
	02N21W28A02S	11/17/2021	ND	ND	ND	25	ND	ND	15	ND	ND	2	2	ND	ND	5
	03N20W32K01S	11/9/2021	ND	ND	ND	25	ND	ND	18	ND	ND	4	2	ND	ND	7
	03N21W35P02S	11/9/2021	ND	ND	1	47	ND	ND	16	ND	ND	2	89	ND	ND	ND

Table D-2 Metals(cont.)

GW Basin/Subbasin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Mound	02N22W10N04S	9/14/2021	ND	ND	1	17	ND	ND	ND	ND	ND	2	24	ND	ND	ND
	02N23W13K03S	9/14/2021	ND	ND	2	19	ND	ND	ND	ND	ND	ND	5	ND	ND	ND
Ojai Valley	04N22W04P05S	11/10/2021	ND	ND	ND	30	ND	ND	13	ND	ND	2	4	ND	ND	4
	04N22W06J09S	11/10/2021	ND	ND	ND	50	ND	ND	14	ND	ND	3	2	ND	ND	5
	04N23W12B03S	11/10/2021	ND	ND	2	51	ND	ND	10	ND	ND	3	8	ND	ND	ND
	05N22W33J01S	11/10/2021	ND	ND	ND	19	ND	ND	19	ND	ND	6	1	ND	ND	6
Oxnard – Forebay Management Area	02N21W07P04S	10/21/2021	ND	ND	ND	24	ND	ND	ND	ND	ND	ND	3	ND	ND	ND
Oxnard	01N21W04D04S	11/18/2021	ND	ND	2	80	ND	ND	16	ND	ND	2	6	ND	ND	5
	01N21W17B02S	11/15/2021	ND	ND	7	92	ND	ND	11	ND	ND	2	2	ND	ND	ND
	01N21W21K03S	11/5/2021	ND	ND	ND	60	ND	ND	ND	ND	ND	ND	3	ND	ND	ND
	01N22W12Q03S	11/16/2021	ND	ND	2	22	ND	ND	10	ND	ND	3	3	ND	ND	ND
	01N22W36B02S	11/15/2021	ND	ND	1	42	ND	ND	14	ND	ND	2	6	ND	ND	4
	02N22W24P02S	10/20/2021	ND	ND	1	20	ND	ND	ND	ND	ND	ND	9	ND	ND	ND
	02N22W30F03S	11/5/2021	ND	ND	ND	16	ND	ND	ND	ND	ND	2	2	ND	ND	ND
Piru	04N19W25H01S	9/8/2021	ND	ND	2	29	ND	0.3	ND	ND	ND	6	11	ND	ND	ND
	04N19W34J04S	9/8/2021	ND	ND	ND	18	ND	ND	ND	ND	ND	2	7	ND	ND	ND
Pleasant Valley	01N21W01M02S	11/16/2021	ND	ND	ND	149	ND	ND	19	ND	ND	2	4	ND	ND	5
	01N21W02J01S	11/16/2021	ND	ND	5	22	ND	ND	20	ND	ND	17	45	ND	ND	5
	01N21W15D02S	11/18/2021	ND	ND	3	33	ND	ND	13	ND	ND	4	11	ND	ND	ND
	02N20W19L05S	12/7/2021	ND	ND	3	55	ND	ND	3	ND	ND	15	42	ND	ND	2
	02N20W29B02S	10/4/2021	ND	ND	5	45	ND	ND	ND	ND	ND	ND	2	ND	ND	13
Santa Paula	02N22W03E01S	9/22/2021	ND	ND	2	28	ND	ND	ND	ND	ND	5	10	ND	ND	ND
	03N21W17Q01S	9/13/2021	ND	ND	2	26	ND	0.3	ND	ND	ND	5	30	ND	ND	ND
Simi Valley	02N18W08D04S	11/10/2021	ND	ND	2	10	ND	ND	12	ND	ND	5	19	ND	ND	ND
	02N18W08K07S	11/10/2021	ND	ND	2	12	ND	ND	10	ND	ND	6	65	ND	ND	4
	02N18W09E01S	11/10/2021	ND	ND	2	11	ND	ND	11	ND	ND	4	39	ND	ND	ND
	02N18W10A02S	12/7/2021	ND	ND	3	17	ND	ND	8	ND	ND	12	77	ND	ND	12
Tierra Rejada	02N19W14Q02S	11/19/2021	ND	ND	3	5	ND	ND	17	ND	ND	18	6	ND	ND	ND
	02N19W15B01S	11/9/2021	ND	ND	2	14	ND	ND	15	ND	ND	2	3	ND	ND	3
	02N19W15N03S	10/4/2021	ND	ND	5	7	ND	ND	ND	ND	ND	ND	ND	ND	ND	6
Upper Ojai Valley	04N22W10K05S	10/19/2021	ND	ND	4	103	ND	2.2	ND	ND	ND	4	22	ND	ND	8
	04N22W11J01S	10/14/2021	ND	ND	ND	50	ND	ND	ND	ND	ND	ND	1	ND	ND	ND
	04N22W11P02S	10/14/2021	ND	ND	2	113	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ventura River – Lower Subbasin	02N23W05K01S	9/15/2021	ND	ND	2	22	ND	ND	13	ND	ND	2	4	ND	ND	ND
Ventura River- Upper Subbasin (outside)	04N23W33M02S	9/17/2021	ND	ND	1	74	ND	ND	ND	ND	ND	3	4	ND	ND	ND
Gillibrand/Tapo	03N18W24C07S	11/10/2021	ND	ND	2	44	ND	ND	14	ND	ND	4	63	ND	ND	8

Table D-3 Radiochemistry

GW Basin	SWN	Date	Alpha pCi/L	CE	Uranium pCi/L	CE
Cuddy Ranch Area	08N21W33R03S	11/12/2021	1.65	1.46		
Lockwood Valley	08N20W04N02S	11/12/2021	4.06	0.938		

* CE – Counting Error

Appendix E – Piper Diagrams

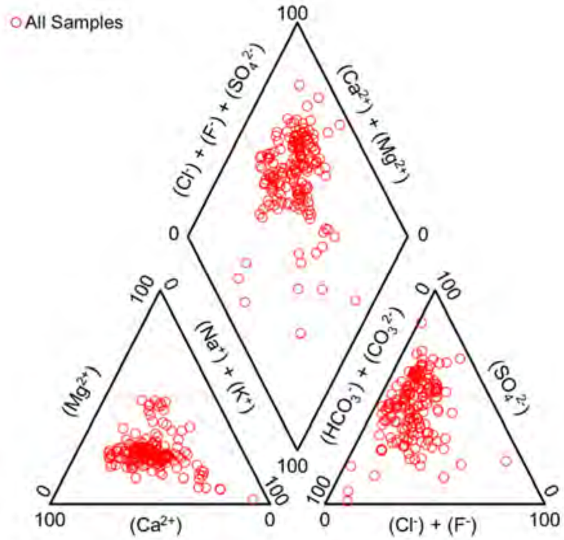

Figure E-1: Piper diagram for All Samples.

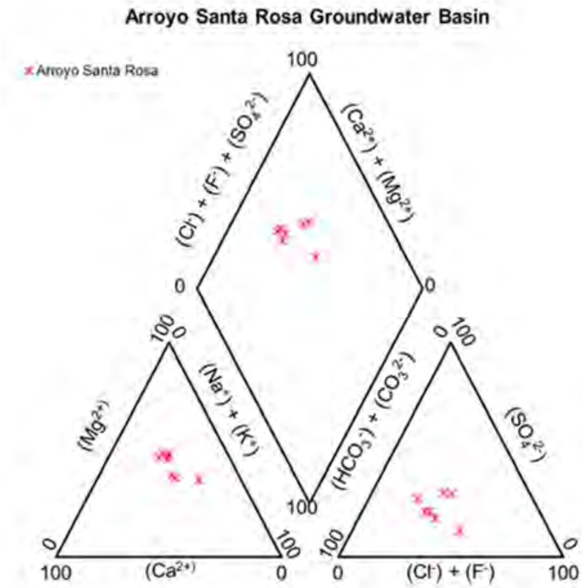

Figure E-2: Arroyo Santa Rosa Basin Piper diagram.

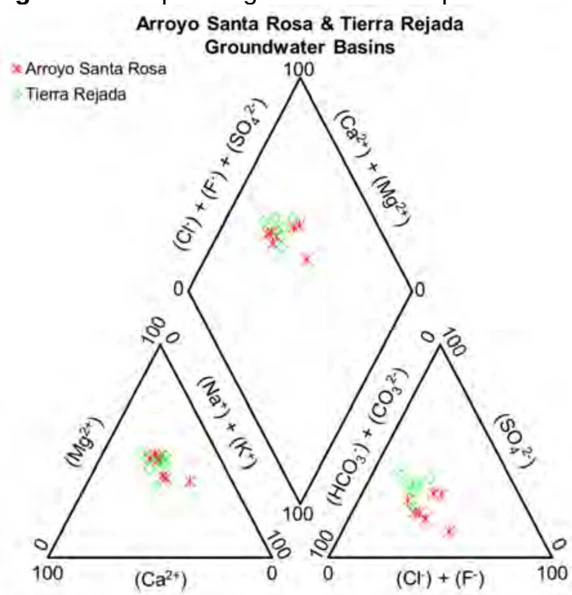

Figure E-3: Arroyo Santa Rosa & Tierra Rejada basins Piper diagram.

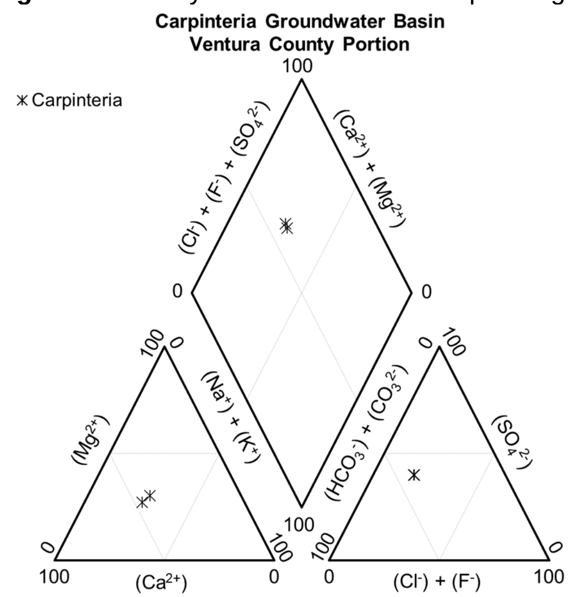

Figure E-4: Carpinteria Basin Piper diagram.

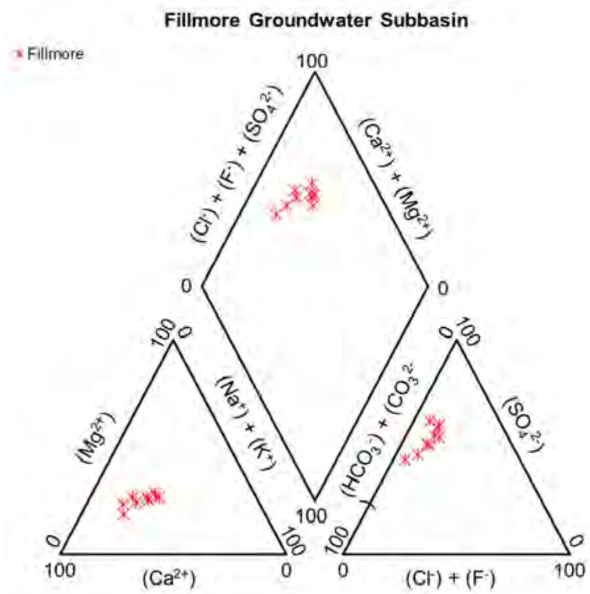

Figure E-5: Fillmore Subbasin Piper diagram.

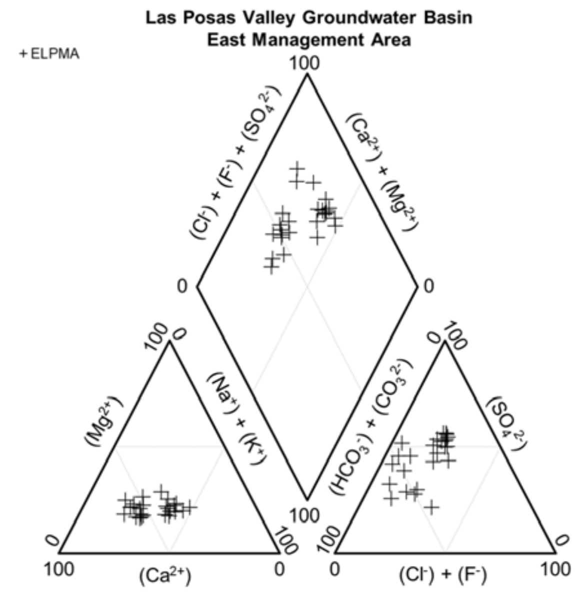

Figure E-6: Las Posas Valley EMA Piper diagram.

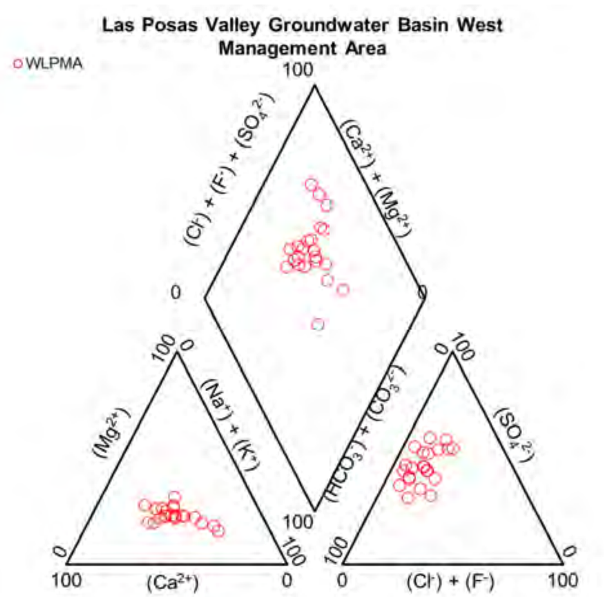

Figure E-7: Las Posas Valley WMA Piper diagram.

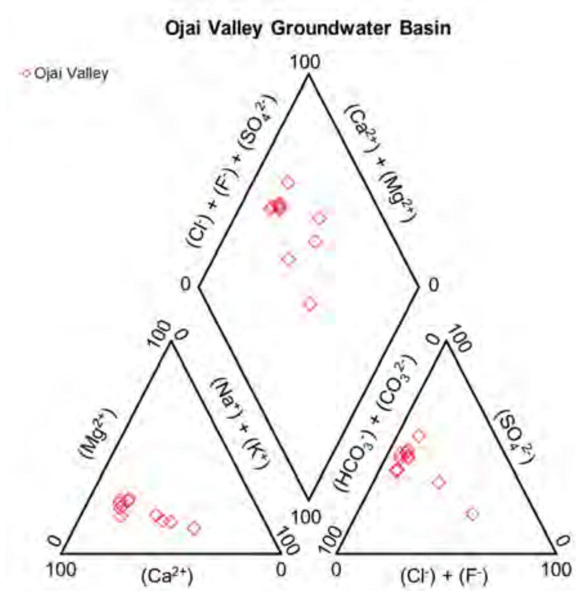

Figure E-8: Ojai Valley Basin Piper diagram.

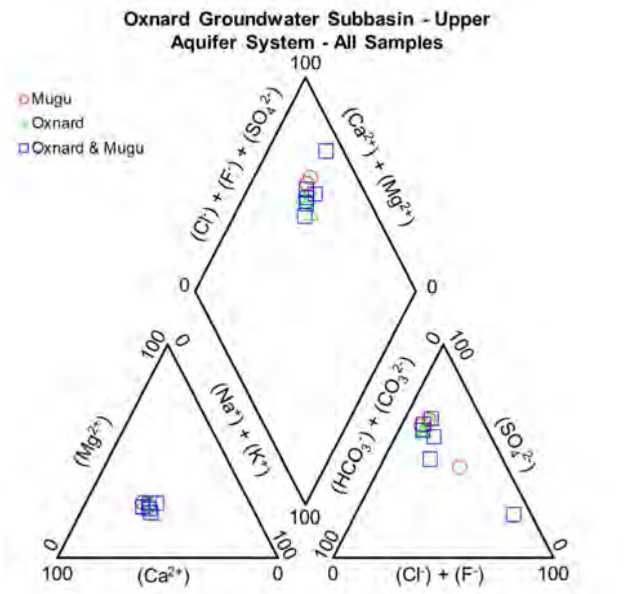

Figure E-9: All Upper Aquifer System Piper diagram.

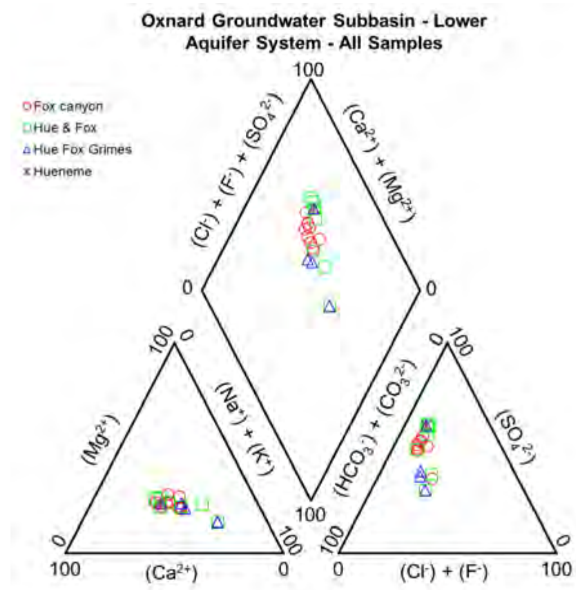

Figure E-10: All Lower Aquifer System Piper diagram.

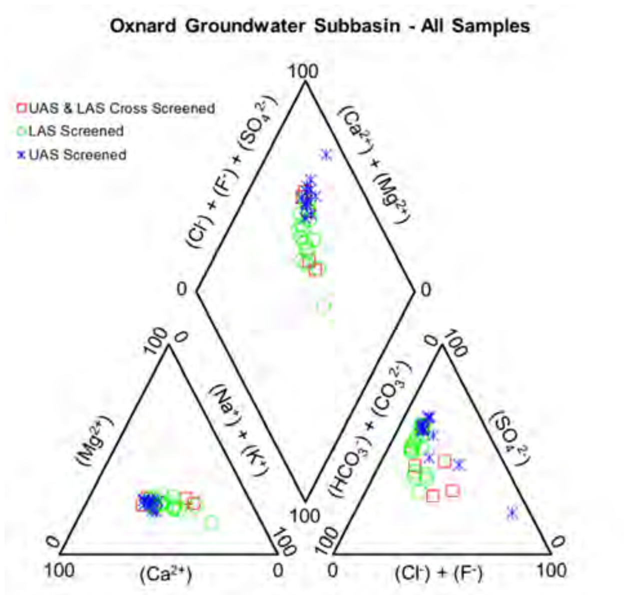

Figure E-11: Oxnard Subbasin Piper diagram All Samples.

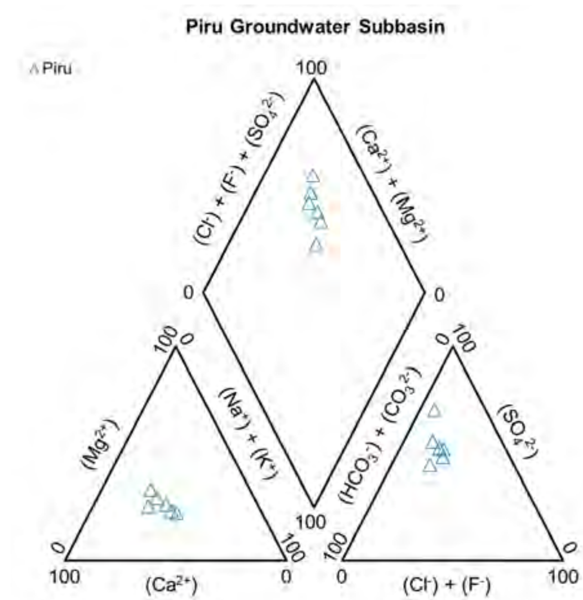

Figure E-12: Piru Subbasin Piper diagram.

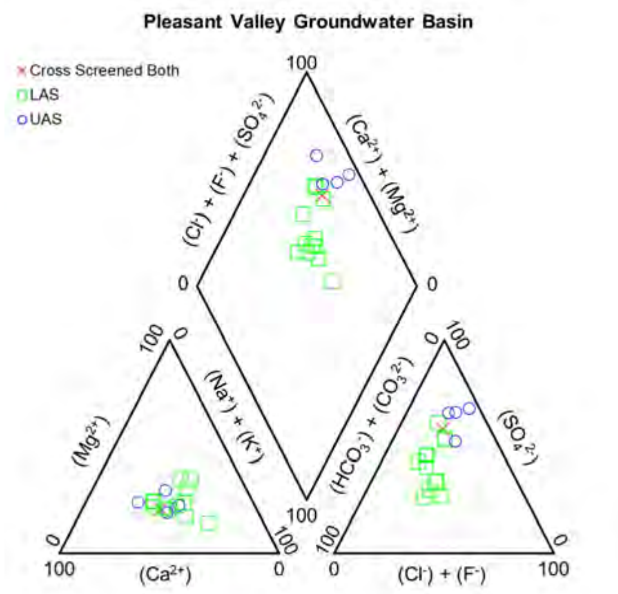

Figure E-13: Pleasant Valley Basin Piper diagram.

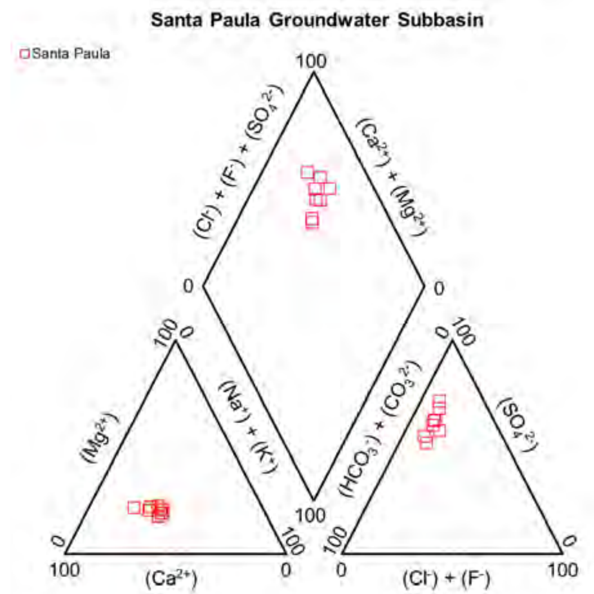

Figure E-14: Santa Paula Subbasin Piper diagram.

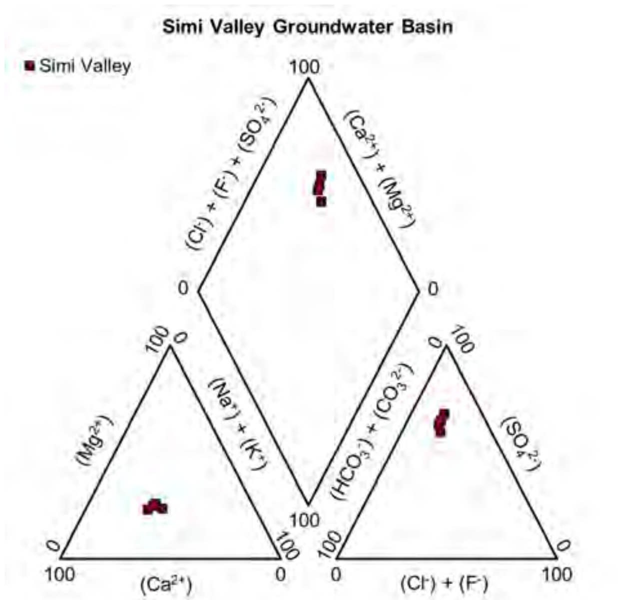

Figure E-15: Simi Valley Basin Piper diagram.

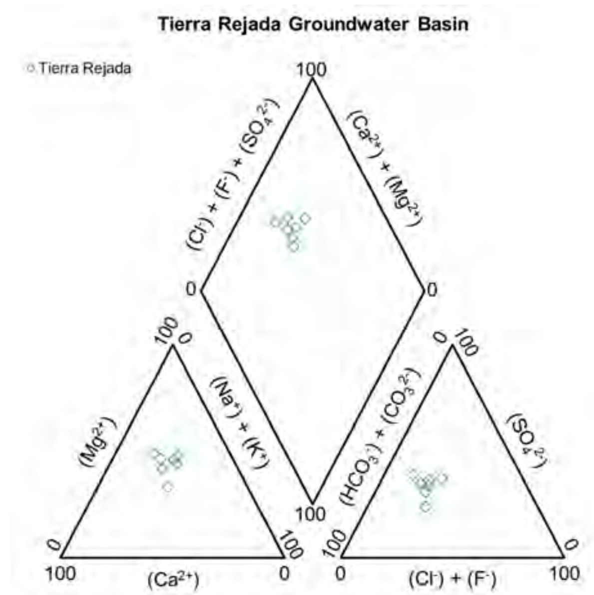

Figure E-16 Tierra Rejada Valley Basin Piper diagram.

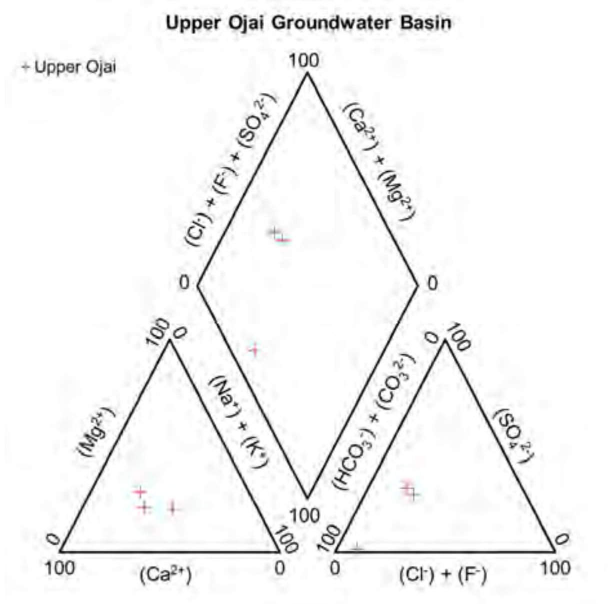

Figure E-17: Upper Ojai Basin Piper diagram.

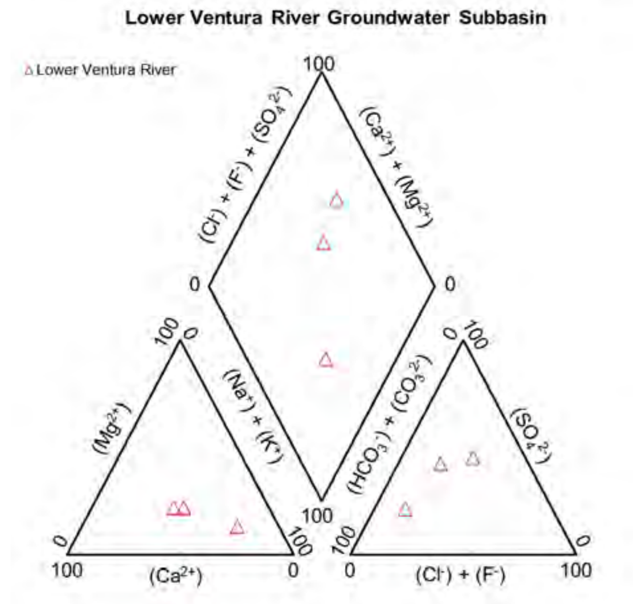

Figure E-18: Ventura River - Lower Subbasin Piper diagram.

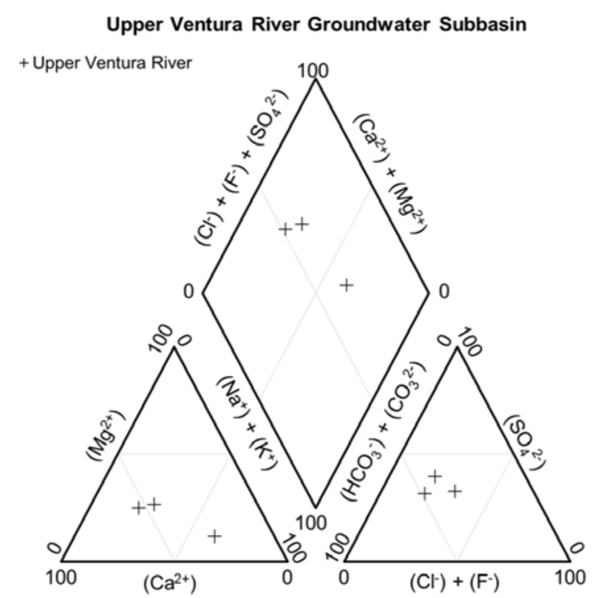

Figure E-19: Ventura River – Upper Subbasin Piper diagram.

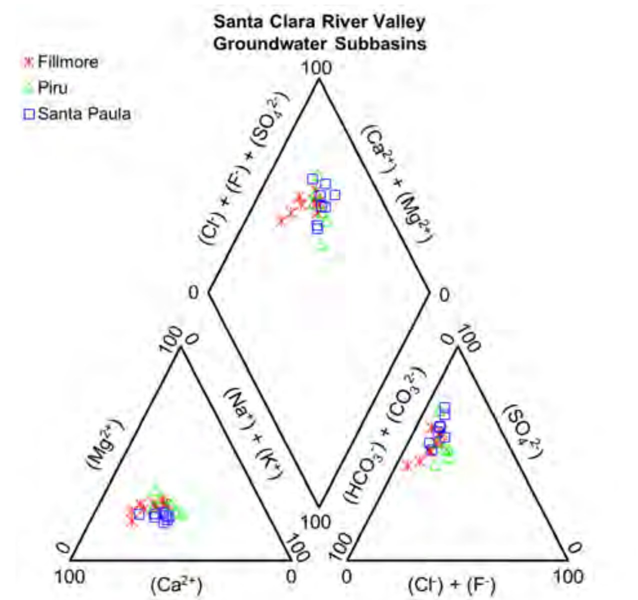

Figure E-20: Fillmore, Piru & Santa Paula subbasins Piper diagram.

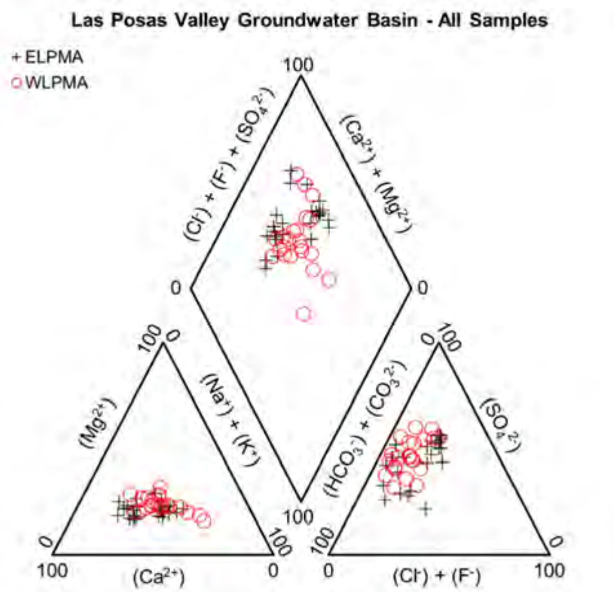

Figure E-21: Las Posas Valley Basin Piper Diagram.

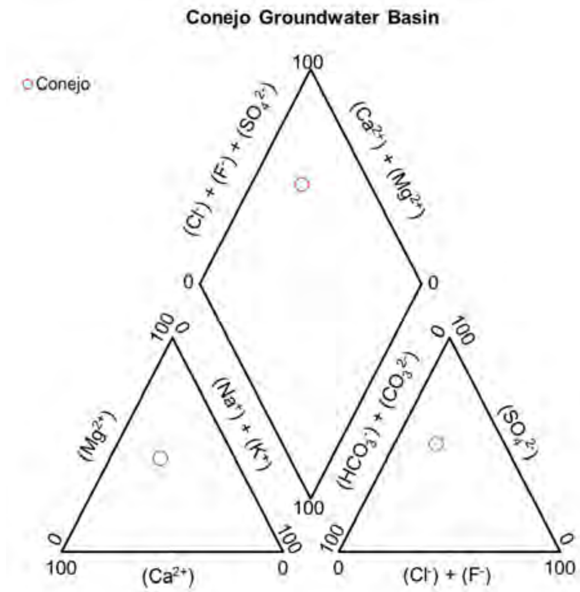

Figure E-22: Conejo Basin Piper Diagram.

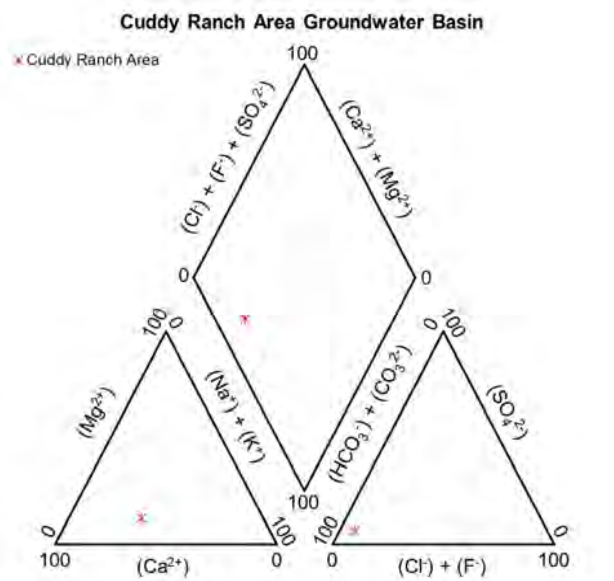

Figure E-23: Cuddy Ranch Area Basin Piper Diagram.

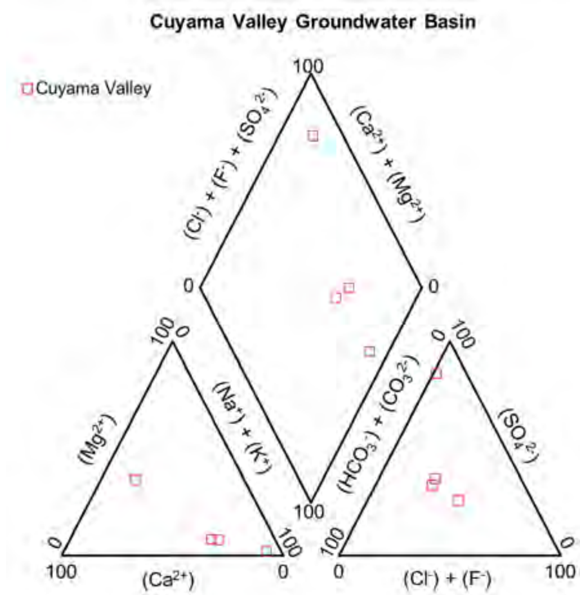

Figure E-24: Cuyama Valley Basin Piper Diagram.

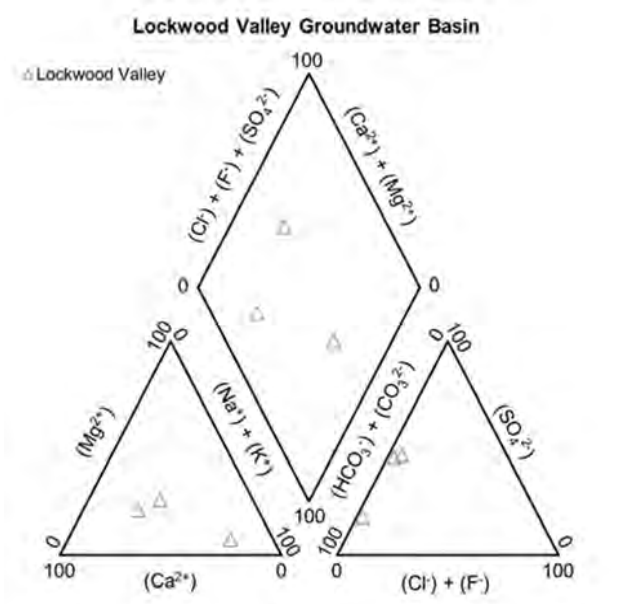

Figure E-25: Lockwood Valley Basin Piper Diagram.

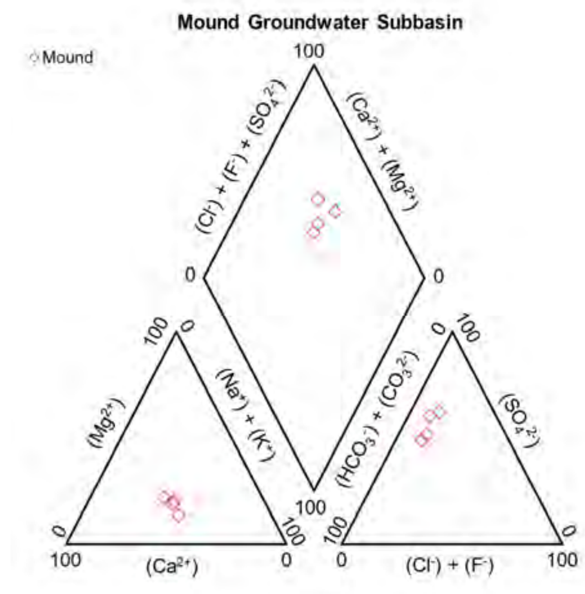

Figure E-26: Mound Subbasin Piper Diagram.

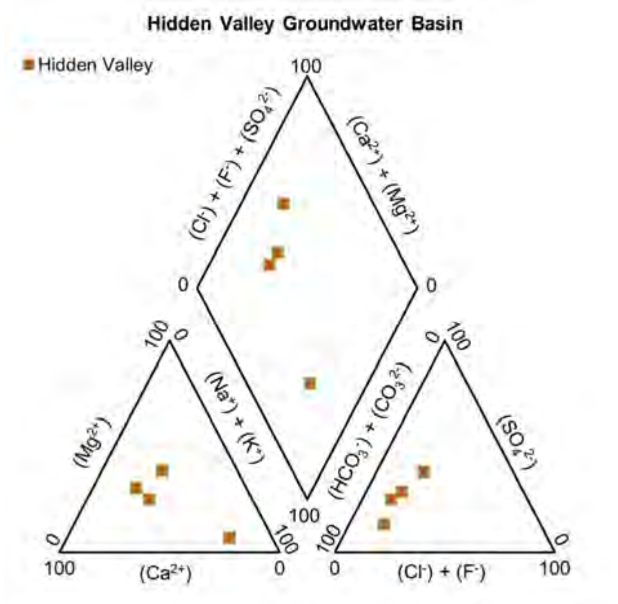

Figure E-27: Hidden Valley Basin Piper Diagram.

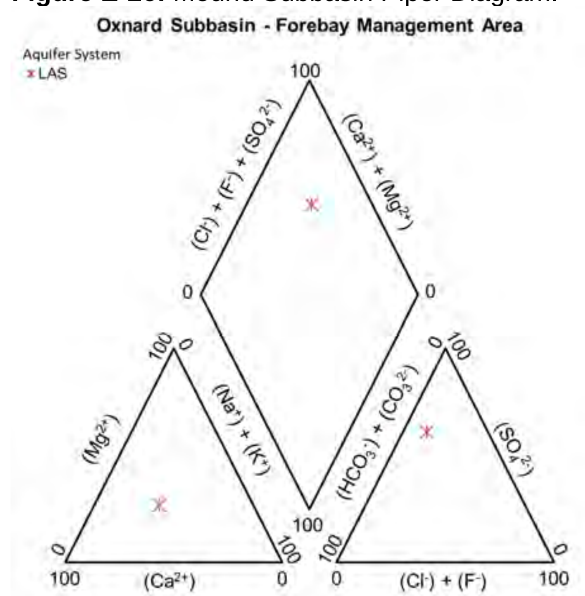

Figure E-28: Oxnard Subbasin Forebay Management Area.

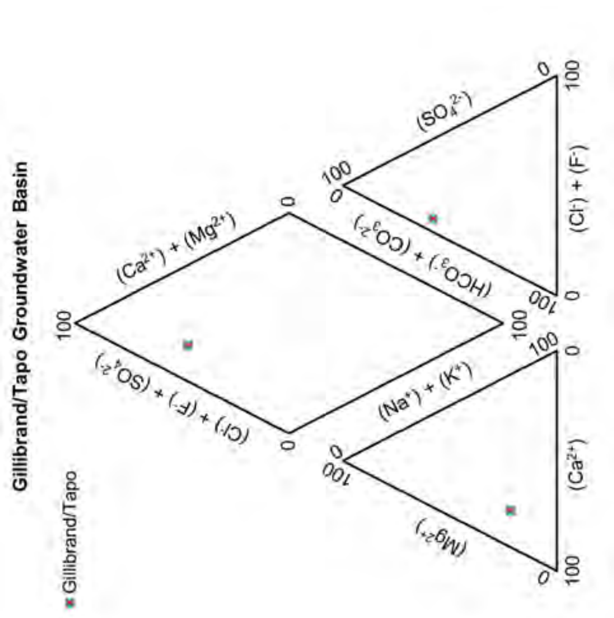

Figure E-29: Gillibrand/Tapo Basin Piper Diagram.

Appendix F - Basin Summary Sheets

The following basin summary sheets provide an overview of data, trends, and facts for groundwater basins in the County designated as high and medium priority in June of 2014 by the California Statewide Groundwater Elevation Monitoring (CASGEM) Program. Trends for groundwater levels and groundwater quality were determined over the last five years for 2021. Trend analysis used sample sets with wells that were sampled or measured consistently over the five year period where available. In some instances this resulted in a small sample set. The spatial distribution of wells may not cover the entire groundwater basin. Data from VCWPD and other agencies was also used in the trend analysis.

Arroyo Santa Rosa Basin

Groundwater Basin Surface Area:	3,270 acres
Irrigated Acreage:	≈1,755 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Arroyo Santa Rosa Valley Basin (4-7). Surface area 3,747 acres. (DWR, 2014)
SGMA Basin Priority:	Very Low
DWR Groundwater Basin Population:	2,434 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 85

Active: 37
Destroyed: 32
Abandoned: 6
Can't Locate: 10

2021 Self Reported Groundwater Extraction to FCGMA (as of May 11, 2022) (West part of basin only)

Agricultural Extractions - 667.5 AF/Yr
Municipal, Industrial and Domestic - 0 AF/Yr

Water Demand Estimate (Whole basin)

Irrigation Demand @ 2 AF/Ac:3,510 AF/Yr

Municipal Demand @ 0.5 AF/person/Yr: 1,105 AF/Yr

Total Demand Estimate: 4,615 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N20W26B03S - December level was down 7.83 feet from the March measurement..

In general, for 3 wells measured spring & fall in 2021 in the basin, water levels declined in all 3 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2021 Groundwater Quality in General for All Wells Sampled by County (7 wells)

Six water samples are magnesium bicarbonate type and one is sodium chloride type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 5 wells
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 7 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	No

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 02N20W26B03S: ↓

In general for 4 wells consistently measured: (3 wells) ↓ (1 well) ↑

5 Year Groundwater Quality Trend 2017-2021

SWN	Nitrate	Chloride	TDS	Sulfate
02N19W19P02S	↓	→	↑	→
02N20W23G03S	↑	↓	↑	↑
02N19W20L01S	↓	↓	↓	↑

Wells are generally in the southern central part of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Tierra Rejada basin. Surface flow percolation from Arroyo Santa Rosa and Conejo Creek. Waste water returns from residential onsite septic systems. (MWH, 2013)

Potable Water Sources

Groundwater from Arroyo Santa Rosa Basin. Imported State Water Project water from Metropolitan Water District via Calleguas Municipal Water District.

Non-Potable Water Source

Reclaimed water from Hill Canyon Waste Water Treatment Plant via Conejo Creek.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Arroyo Santa Rosa basin receive some subsurface inflow from Tierra Rejada basin. (MWH, 2013)

Downgradient: No

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Some primary and secondary inorganic contaminants above the MCL (B-118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Cuyama Valley Basin

Groundwater Basin Surface Area:	16,560 acres
Irrigated Acreage:	≈1,410 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Cuyama River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Cuyama Valley (3-13) Surface area 242,114 Acres. (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	1,259 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 140
Active: 102
Destroyed: 6
Abandoned: 8
Non-Complaiant: 6
Can't Locate: 18

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac: 2,820 AF/Yr

Municipal Demand @ 0.5 AF/person/Yr: 618 AF/Yr
Total Demand Estimate: 3,438 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

Note: Wells are measured twice per year in the Cuyama Valley basin.

"Key" well 07N23W16R01S - Well was dry at the fall measurement.

Both spring and fall measurements were obtained on 4 wells in the basin in 2021. The water level decreased in 2 wells and increased in 2 wells from the spring measurement to the fall measurement.

2021 Groundwater Quality in General for All Wells Sampled by County

(3 wells)

The water in one sample is calcium sulfate type; the water in one sample is sodium chloride type and the water in two samples is sodium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Excedances for Chloride >250mg/l?	Yes, 1 well
Secondary MCL Excedances for TDS >500mg/l?	Yes, 3 wells
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 1 well

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 07N23W16R01S: ↑

In general for 4 wells consistently measured: 2 wells ↓ 2 wells ↑

5 Year Groundwater Quality Trend 2017-2021

SWN	Nitrate	Chloride	TDS	Sulfate
09N23W30E05S	↑	↑	↑	↑
08N24W17G02S	→	↓	→	→

Wells are in the northern portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Seepage from the Cuyama River. (DWR, 2006)

Potable Water Sources

Groundwater from Cuyama Valley groundwater basin.

Subsurface Hydrologic Connection to Other Groundwater Basins

Within Ventura County: None

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments:Local salinity and TDS impairments in basin (B-118)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Fillmore Subbasin

Groundwater Basin Surface Area:	22,583 acres
Irrigated Acreage:	≈12,230 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Fillmore Subbasin (4-4.05). Surface area 22,583 acres. (DWR, 2006)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	16,240 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 611
Active: 447
Destroyed: 78
Abandoned: 29
Can't Locate: 51
Non-Compliant: 6

2021 Self Reported Groundwater Extraction to UWCD (as of February 25, 2022)

Agricultural Extractions: 22,357 AF/Yr

Municipal & Industrial Extractions: 1,320 AF/Yr

Total Extractions: 23,677 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 03N20W05D01S - December level was down 10.75 feet from the March measurement.

In general, for 11 wells measured in the basin in 2021, water levels declined in all 11 wells over the course of the year from the 1st quarter reading to the last quarter.

2021 Groundwater Quality in General for All Wells Sampled by County

(9 wells)

One water sample is calcium bicarbonate type and the remaining eight samples are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 3 wells
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 9 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 8 wells

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 03N20W05D01S: ↑

The 5 year trend based on 2016 through 2020 groundwater level elevations is upward.

5 Year Groundwater Quality Trend 2017-2021

(*sampled by UWCD)

SWN	Nitrate	Chloride	TDS	Sulfate
04N20W36P04S	↓	↑	↓	→
03N21W01P08S	→	→	↑	↓
04N19W31F01S	↑	↑	→	↓
04N19W30D01S*	↑	↑	↑	↑
04N20W33C03S*	↑	↑	↑	→

Wells are distributed throughout the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Piru basin. Surface flow percolation from Santa Clara River, Sespe Creek, and minor tributaries. (DWR, 2006) Imported State Water Project water via Lake Piru release to Santa Clara River.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Piru groundwater basin.
Downgradient: Yes, Santa Paula groundwater basin.

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Many groundwater quality impairments in the basin; Nitrates problematic during dry periods; High TDS, etc. (B-118). REH - Public comment indicated WQ is localized and being managed

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Las Posas Valley Basin East Management Area

Management Area Name:	East Las Posas Management Area
ELPMA Surface Area:	27,180 acres
Irrigated Acreage:	≈10,000 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Los Posas Valley Basin (4-8). Surface area 42,353 acres. Note: DWR groups three County basins into Las Posas Valley Basin (4-8) (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	42,721 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 403
Active: 165
Destroyed: 143
Abandoned: 37
Can't Locate: 54
Exempt: 1
Non-Compliant: 3

2021 Self Reported Groundwater Extraction to FCGMA (as of May 18, 2022)

Agricultural Extractions: 17,498 AF/Yr

Municipal, Industrial, and Domestic Extractions: 1,596 AF/Yr

Values are approximate based on FCGMA East and South Las Posas basins.

Total: 19,094 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 03N20W26R03S - Level was down 14.6 feet in December from the March measurement.

In general, for 11 wells measured for the 1st and 4th quarters in 2021 in the basin, water levels declined in all 10 wells and rose in 1 well over the course of the year.

2021 Groundwater Quality in General for All Wells Sampled by County

(25 wells)

The water in 8 wells is calcium bicarbonate type, calcium sulfate type in 10 wells, sodium bicarbonate type in 1 well, and sodium sulfate type in 6 wells.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 3 wells
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 18 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 13 wells

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 03N20W26R03S: ↑

The 5 year trend based on 2017 through 2021 groundwater level elevation maps varies.

Of the 13 measured wells in the basin 10 show a downward trend and 3 of the wells show a rising trend.

5 Year Groundwater Quality Trend 2017-2021

SWN	Nitrate	Chloride	TDS	Sulfate
02N20W04B01S	→	→	→	→
02N20W16B06S	↑	→	→	↓
03N19W29K08S	→	→	↑	→
03N19W29K06S	↓	↓	↑	↑

One well is located in the southwest,one well in the midwest, and two wells are located in the northeast.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation, minor stream flow across outcrops of the Fox Canyon and Grimes Canyon gravels, and percolation from flow in the Arroyo Las Posas. (DWR, 2006) Imported State Water Project water via injection in the Calleguas Municipal Water District ASR well field.

Potable Water Sources

Groundwater from East Las Posas basin. Imported State Project Water from Calleguas MWD to various purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

West:Possible connection to West Las Posas basin in NW part of basin.

South/Southeast: South Las Posas Basin.

Southwest: Restrictive subsurface structure between Pleasant Valley basin and East Las Posas basin may cause spillover from East Las Posas to Pleasant Valley when basin is full.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: TDS is generally high in this basin. Pubic Comment includes reports of subsidence, overdraft and saline intrusion

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Las Posas Valley Basin West Management Area

Management Area Name:	West Las Posas Management Area (WLPMA)
WLPMA Surface Area:	17,442 acres
Irrigated Acreage:	≈9,950 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Los Posas Valley Basin (4-8). Surface area 42,353 acres. Note: DWR groups three County basins into Las Posas Valley Basin (4-8) (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	42,721 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 164
Active: 89
Destroyed: 60
Abandoned: 9
Can't Locate: 5
Non-Compliant: 1

2021 Self Reported Groundwater Extraction to FCGMA (as of May 18, 2022)

Agricultural Extractions: 10,642 AF/Yr

Municipal, Industrial, and Domestic Extractions: 1,673 AF/Yr

Values are approximate based on FCGMA West Las Posas basin.

Total: 12,315 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N21W11J04S - Level was down 5.4 feet in December from the March measurement.

In general, for 14 wells consistently measured in 2021 in the basin, water levels declined in all 14 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2021 Groundwater Quality in General for All Wells Sampled by County
(23 wells)

The water in nine wells is calcium bicarbonate type, three are sodium bicarbonate type, four are sodium sulfate type, and eight are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 4 wells
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 19 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 12 wells

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 02N21W11J04S: ↓ (red)

For 18 wells measured, the 5 year trend based on 2017 through 2021 groundwater level elevationis is mixed with 14 wells declining and 4 wells showing an increasing water level elevation trend.

5 Year Groundwater Quality Trend 2017-2021

SWN	Nitrate	Chloride	TDS	Sulfate
02N21W15M04S	↓	↓	↓	↓
02N21W17F05S	→	↓	↓	↓
02N21W11A03S	→	↓	↑	↑
02N21W13A01S	→	→	↑	↑

Wells are in various locations in the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation, minor stream flow across outcrops of the Fox Canyon and Grimes Canyon gravels, and percolation from flow in the Arroyo Las Posas. (DWR, 2006)

Potable Water Sources

Groundwater from West Las Posas basin. State Water Project water from Calleguas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

East: Possible connection to East Las Posas basin in NW part of basin.

Southwest: Yes, Oxnard Plain Pressure basin.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: TDS is generally high in this basin. Pubic Comment includes reports of subsidence, overdraft and saline intrusion

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Mound Subbasin

Irrigated Acreage:	≈2,075 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Mound Subbasin (4-4.03) Surface area 13,864 Acres. (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	75,298 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 86
Active: 31
Destroyed: 42
Abandoned: 5
Can't Locate: 7
Non-Compliant: 1

2021 Self Reported Groundwater Extraction to UWCD (as of February 25, 2022)

Agricultural Extractions: 1,213 AF/Yr

Municipal & Industrial Extractions: 1,071 AF/Yr

Total Extractions: 2,284 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 02N22W07M02S (measured by UWCD) - November level was up 5.9 feet from the January measurement.

In general, for 1 well consistently measured in the basin in 2021, water level declined from the 1st quarter reading to the last quarter reading.

2021 Groundwater Quality in General for All Wells Sampled by County

(4 wells)

Three samples are calcium sulfate type and one sample is sodium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	No
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 4 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 4 wells

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 02N22W07M02S: ⬇

The 5 year trend for wells measured by VCWPD based on 2017 through 2021 groundwater level elevations is mixed .

5 Year Groundwater Quality Trend 2017-2021

(Based on wells sampled by VCWPD and other agencies)(D=Deep aquifer S=Shallow aquifer)

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W09K07S (D)	⇨	⬆	⬆	⇨
02N22W07M03S (S)	⇨	⇨	⬆	⬆
02N22W09L04S (S)	⬇	⬇	⬆	⬇

Wells are generally in the center of the basin along a east to west line.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Santa Paula basin. Surface flow percolation from Santa Clara River and, percolation of direct precipitation into the San Pedro Formation which crops out along the northern edge of the subbasin. (DWR, 2006) Imported State Project Water via Lake Piru release to Santa Clara River.

Potable Water Sources

Groundwater from Mound Basin, Ventura River Basin, Oxnard Plain Pressure Basin via Ventura Water System. Surface water from Ventura River diversion via Ventura Water System. Surface water from Lake Casitas via Casitas Municipal Water District to Ventura Water System.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Santa Paula groundwater basin.

East/Southeast: Yes, Oxnard Plain Forebay and Oxnard Plain Pressure groundwater basins. Flow into and out of basin dependent on groundwater levels.

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Some primary and secondary inorganic contaminants above the MCL (B-118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend ⇨ Level trending up ⬆ Level Trending down ⬇

Ojai Valley Basin

Groundwater Basin Surface Area:	6,851 Acres (DWR, 2014)
Irrigated Acreage:	≈2,135 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Ventura River
Aquifers:	Unconfined and confined aquifers
DWR Groundwater Basin Designation:	Ojai Valley Basin (4-2)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	7,745 (2010)

Known Water Supply Wells (as of May 2022)	**2021 Self Reported Groundwater Extractions to OBGMA (as of February 25, 2022)**	**Water Demand Estimate**
Number of Wells: 327 Active: 191 Destroyed: 76 Abandoned: 11 Can't Locate: 48 Non Compliant: 1	Extractions: 3,481 Af/Yr	Irrigation Demand @ 2 AF/Ac:4,270 AF/Yr Municipal Demand @ 0.5AF/person/Yr: 4,134 AF/Yr Total Demand Estimate: 8,404 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N22W05L08S: - The December reading was down 8.4 feet from the March level.

In general, for 16 wells consistently measured in 2021 in the basin, water levels declined in 15 wells and rose in 1 well over the course of the year from the 1st quarter reading to the last quarter reading.

2021 Groundwater Quality in General for All Wells Sampled by County

(11 wells)

The water in five wells is calcium bicarbonate type, four wells are calcium sulfate type, one well is sodium bicarbonate type, and one is calcium chloride type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 1 well
Secondary MCL Exceedances for Chloride >250mg/L?	Yes, 1 well
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 11 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 2 wells

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 04N22W05L08S: ↑

In general, for 17 wells consistently measured: (13 wells)↑ (4wells) ↓

5 Year Groundwater Quality Trend 2017-2021

SWN	Nitrate	Chloride	TDS	Sulfate
04N23W01K02S	↓	↓	↓	→
05N22W33J01S	→	↑	↑	↑
04N22W04Q01S	↑	→	↑	↓
04N23W12B03S	→	↑	↑	↑

Wells are located in various areas of the basin.

Sources of Groundwater Recharge

Basin Recharge:infiltration of precipitation on the valley floor, and percolation of surface waters through alluvial channels. (DWR, 2006)

Potable Water Sources

Groundwater from Ojai Valley Basin. Surface water from Lake Casitas via Casitas Municipal Water District to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: No

Downgradient: No. The basin is drained by Thacher and San Antonio Creeks to the Ventura River. (DWR, 2006)

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: High nitrates and sulfates reported in the basin. Medium to high levels of nitrates reported in the basin

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Oxnard Subbasin

DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Oxnard Subbasin (4-4.02) Surface area 57,642 Acres. Note: DWR groups two County basins into Oxnard Subbasin (4-4.02) (DWR, 2014)
Irrigated Acreage:	≈21,540 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River and Calleguas Creek
Aquifers:	Unconfined and confined aquifers
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	237,466 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 1,184
Active: 462
Destroyed: 545
Abandoned: 74
Exempted: 1
Can't Locate: 98
Non-Compliant: 4

2021 Self Reported Groundwater Extraction to FCGMA (as of May 18, 2022)

Agricultural Extractions: 43,494 AF/Yr

Municipal, Industrial, and Domestic Extractions: 28,391 AF/Yr

Total: 71,885 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

UAS "Key" well 01N21W07H01S - December level was down 4.30 feet from the March measurement.

LAS "Key" well 01N21W32K01S - November level was down 27.4 feet from the January measurement.

In general, for 24 wells consistently measured in 2021 in the basin, water levels declined in 22 wells and rose in 2 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2021 Groundwater Quality in General for All Wells Sampled by County
(36 wells)

UAS - The water in the UAS is best classified as a calcium sulfate type.
LAS - Three water samples are sodium sulfate type, five samples are sodium bicarbonate type, and the remainder are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	No
Secondary MCL Exceedances for Chloride >250mg/L	Yes, 1 well
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 36 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 27 wells

5 Year Groundwater Level Trend 2017 - 2021

UAS "Key" well 01N21W07H01S: ↑

LAS "Key" well 01N21W32K01S: ↑

Upper System

The 5 year trend based on 2017 through 2021 groundwater level elevations is mostly upward with only one well trending downward.

Lower System

The 5 year trend based on 2017 through 2021 groundwater level elevations is mostly upward with only two wells trending downward.

5 Year Groundwater Quality Trend 2017-2021

Upper System

SWN	Nitrate	Chloride	TDS	Sulfate
01N22W06B01S	↓	↑	↑	↑
01N22W06R02S	↓	↑	↑	↓

Lower System

SWN	Nitrate	Chloride	TDS	Sulfate
01N21W08R01S	→	↑	↑	↓
01N21W04D04S	→	↑	↑	↓
01N21W21H02S	→	↓	→	↓
01N22W26M03S	↓	↑	↑	↓
02N21W20Q05S	→	↑	↑	↓
02N22W24P02S	↑	→	↑	↓

For upper system, both wells are in the northwest. For lower system the wells are generally in the center of the basin along a northeast to southwest line, and a small group in the southeast.

Sources of Groundwater Recharge

Basin Recharge:percolation of surface flow from the Santa Clara River, into the Oxnard Forebay; precipitation and floodwater from the Calleguas Creek drainage percolate into the unconfined gravels near Mugu Lagoon. Some underflow may come from the Las Posas and Pleasant Valley Basins on the east. Flow into and out of Mound basin dependent on water levels. (DWR, 2006). Imported State Water Project water via Lake Piru release to Santa Clara River

Potable Water Sources

Groundwater from Oxnard Plain Pressure Basin via various purveyors. Groundwater from Oxnard Forebay basin via United Water system. Surface water from Santa Clara River via United Water System. Imported State Water Project water from Calleguas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

North: Oxnard Forebay basin, Mound basin

East/Northeast: Pleasant Valley basin, West Las Posas basin

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: Saline intrusion, nitrates, pesticides, and PCBs have impacted some water wells per (B-118)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Oxnard Subbasin Forebay Management Area

Manaegment Area Name:	Forebay Management Area
Forebay Management Area Surface Area:	5,811 acres
Irrigated Acreage:	≈1,797 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined and confined
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Oxnard Subbasin (4-4.02) Surface area 57,642 Acres. Note: DWR groups two County basins into Oxnard Subbasin (4-4.02) (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	237,466 (2010)

Known Water Supply Wells (as of May 2022)	**2021 Self Reported Groundwater Extraction to FCGMA (as of May 18, 2022)**
Number of Wells: 283 Active: 102 Destroyed: 137 Abandoned: 16 Can't Locate: 27 Non-Compliant: 1	Agricultural Extractions: 5,743 AF/Yr Municipal, Industrial, and Domestic Extractions: 10,773 AF/Yr Total: 16,516 AF/yr

2021 Groundwater Levels in General for Wells Gauged by County and UWCD

"Key" well 02N22W12R04S - (Oxnard Aquifer) - Note: Measurements from UWCD.Well was dry all of 2021.

2021 Groundwater Quality in General for All Wells Sampled by County
(1 well)

All samples are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Excedances for Chloride >250mg/l?	No
Secondary MCL Excedances for TDS >500mg/l?	Yes, 1 well
Secondary MCL Excedances for Sulfate >250mg/l?	Yes, 1 well

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 02N22W12R04S: ↓

Upper System

The 5 year trend based on 2017 through 2021 groundwater level elevations is mixed with 5 wells ↓ and 3 wells ↑.

Lower System

The 5 year trend based on 2017 through 2021 groundwater level elevations is upward with all 6 wells increasing.

5 Year Groundwater Quality Trend 2017-2021

Upper System (Includes wells sampled by other agencies)

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W23B02S	↓	→	→	↓
02N22W23G03S	→	↑	↑	→
02N22W11J01S	↑	→	→	→

Lower System

SWN	Nitrate	Chloride	TDS	Sulfate
02N22W13N02S	→	↑	↑	↓
02N22W23H04S	→	→	↑	↓
02N22W26B03S	→	→	↑	↓

Wells are located in the southeast portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: percolation of surface flow from the Santa Clara River and, some subsurface flow from Santa Paula Subbasin makes its way over or across the Oak Ridge fault. Some amount of irrigation return also occurs (DWR, 2006) Imported State Project Water via Lake Piru release to Santa Clara River.

Potable Water Sources

Groundwater from Oxnard Plain Forebay basin. Surface water from Santa Clara River diversion via United Water Conservation District. Groundwater from Oxnard Plain Pressure basin via Oxnard Water System. Imported State Project Water from Calleguas MWD via Oxnard Water System.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Santa Paula groundwater basin to the northwest and Oxnard Plain groundwater basin to the east and south.

Downgradient: Yes, Mound groundwater basin to the southwest. Oxnard Plain Pressure groundwater basin to the south and southwest. Flow into and out of Mound

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: Saline intrusion, nitrates, pesticides, and PCBs have impacted some water wells per (B-118)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Pleasant Valley Basin

DWR Groundwater Basin Designation and Size:	Pleasant Valley Basin (4-6). Surface area 19,838 acres. (DWR, 2014)
Groundwater Basin Surface Area:	20,267 acres
Irrigated Acreage:	≈7,980 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined and confined aquifers
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	66,391 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 347
Active: 85
Destroyed: 186
Abandoned: 27
Can't Locate: 46
Non-Compliant: 3

2021 Self Reported Groundwater Extraction to FCGMA (as of May 18, 2022)

Agricultural Extractions: 10,246 AF/Yr

Municipal, Industrial, and Domestic Extractions: 3,613 AF/Yr

Total: 13,859 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 01N21W03C01S - December level was down 34.8 feet from the January measurement.

In general, for 12 wells consistently measured in 2021 in the basin, water levels declined in all 11 wells and rose in 1 well over the course of the year from the 1st quarter reading to the last quarter reading.

2021 Groundwater Quality in General for All Wells Sampled by County

(18 wells)

The water in four samples is sodium sulfate, five samples are sodium bicarbonate type and the remainder are calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 3 wells
Secondary MCL Exceedances for Chloride >250mg/L?	Yes, 3 wells
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 18 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 11 wells

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 01N21W03C01S: ↑

Upper System

The 5 year trend is up with 1 well increasing and 3 wells declining.

Lower System

The 5 year trend is mixed with 3 well declining and 2 wells showing an increasing trend.

5 Year Groundwater Quality Trend 2017-2021

Upper System

SWN	Nitrate	Chloride	TDS	Sulfate
01N21W12D01S	↓	↑	↑	↑
01N21W10A02S	↑	↓	↑	↓

Lower System

SWN	Nitrate	Chloride	TDS	Sulfate
01N21W03K01S	↓	↑	↑	↓
01N21W03R01S	↓	↓	↑	↓
01N21W10G01S	↓	↓	↓	↓
01N21W15D02S	↑	→	↑	↑
02N21W34G01S	→	↓	↓	↓

One well is in the north central portion, the remaining are in the southwest.

Sources of Groundwater Recharge

Basin Recharge: dominantly from subsurface flow across the Springville fault zone. A modest amount of irrigation water and septic system effluent also contribute to basin recharge. (DWR, 2006)

Potable Water Sources

Groundwater from Pleasant Valley Basin, groundwater from Arroyo Santa Rosa basin via Camrosa Water District. Imported State Water Project water from Calleguas Municipal Water District to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

West: Yes, Oxnard Plain Pressure Basin.

East: No.

DWR CASGEM Groundwater Basin Prioritization Level - High

Impact Comments: PC - Discharge of poor quality GW from dewatering wells and effluent discharge from the wastewater treatment facility into the Arroyo Simi have led to rising water levels in the basin along with higher TDS and Chloride levels.

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Piru Subbasin

Groundwater Basin Surface Area:	10,896 acres
Irrigated Acreage:	≈5,600 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Piru Subbasin (4-4.06). Surface area 10,896 acres. (DWR, 2014)
SGMA Basin Priority:	High
DWR Groundwater Basin Population:	2,744 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 191
Active: 150
Destroyed: 23
Abandoned: 4
Can't Locate: 12
Non-Compliant: 2

2021 Self Reported Groundwater Extraction to UWCD (as of February 25, 2022)

Agricultural Extractions: 5,754 AF/Yr

Municipal Extractions: 229 AF/Yr

Total Extractions: 5,983 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N19W25C02S - December level was down 18.9 feet from the March measurement.

In general, for 4 wells consistently measured in 2021 in the basin, water levels declined in all 4 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2021 Groundwater Quality in General for All Wells Sampled by County

(6 wells)

Piru basin groundwater is mainly calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 1 well
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 6 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 5 wells

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 04N19W25C02S: ↑

The 5 year trend based on 2017 through 2021 groundwater level elevations is mixed with 6 wells showing an upward trend and 1 well showing a downward trend.

5 Year Groundwater Quality Trend 2017-2021

(* sampled by UWCD)

SWN	Nitrate	Chloride	TDS	Sulfate
04N18W30J04S	→	↓	↓	↓
04N19W26H01S	↑	↓	↑	→
04N19W34J04S	↓	↓	↓	↓
04N19W25M03S	→	→	↓	↓
04N18W20R01S*	↓	↓	↓	↓
04N18W27B01S*	→	↓	→	↓
04N18W20M03S*	↑	→	↓	↑

The wells are in the north central portion of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from East basin. Surface flow percolation from Santa Clara River, Piru Creek and Hopper Creek. (DWR, 2006) Imported State Water Project water via Lake Piru release to Santa Clara River and percolation ponds.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, East groundwater basin.
Downgradient: Yes, Fillmore groundwater basin.

DWR CASGEM Groundwater Basin Prioritization Level - High

DWR Impact Comments:GW Quality impacts: nitrates, storm runoff, leaking tanks, etc. (B-118). High Selenium and other inorganics, average TDS was 1450 mg/l (Ventura Co 2011 annual gw report)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Santa Paula Subbasin

Groundwater Basin Surface Area:	22,110 acres
Irrigated Acreage:	≈9,100 acres (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Santa Clara River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation and Size:	Santa Clara River Valley Basin, Santa Paula Subbasin (4-4.04) Surface area 22,110 Acres. (DWR, 2014)
SGMA Basin Priority:	Very Low
DWR Groundwater Basin Population:	47,755 (2010)

Known Water Supply Wells (as of May, 2022)

Number of Wells: 295
Active: 150
Destroyed: 85
Abandoned: 10
Exempted: 1
Can't Locate: 49

2021 Self Reported Groundwater Extraction to UWCD (as of February 25, 2022)

Agricultural Extractions: 6,987 AF/Yr

Municipal & Industrial Extractions: 2,986 AF/Yr

Total Extractions: 9,973 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 03N22W36K05S - December level was down 1.7 feet from the March measurement.

In general, for 6 wells measured in 2021 in the basin, water levels declined in 5 wells and did not change in 1 well over the course of the year from the 1st quarter reading to the last quarter reading.

2021 Groundwater Quality in General for All Wells Sampled by County

(8 wells)

The water type for all samples is calcium sulfate type.

Primary MCL Exceedances for Nitrate >45mg/L?	No
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 8 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 8 wells

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 03N21W17Q01S: ↑

The 5 year trend based on 2017 through 2021 groundwater level elevations is mixed with most wells showing an upward trend.

5 Year Groundwater Quality Trend 2017-2021

(Based on 3 wells sampled by VCWPD and 2 wells sampled by other agencies*)

SWN	Nitrate	Chloride	TDS	Sulfate
03N21W09K04S	→	→	↓	↓
03N21W17Q01S	↓	→	→	↓
03N22W35Q01S	↑	↑	↑	↓
03N21W15G03S*	→	→	↑	→
03N21W16H06S*	→	↑	↑	↓

One well is in the southwest portion of the basin and 4 wells are in the northeast end of the basin.

Sources of Groundwater Recharge

Basin Recharge: Infiltration of precipitation. Subsurface flow from Fillmore basin. Surface flow percolation from Santa Clara River, and Santa Paula Creek (DWR, 2006) Imported State Water Project water via Lake Piru release to Santa Clara River.

Potable Water Sources

Groundwater from Santa Paula Basin

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: Yes, Fillmore groundwater basin.
Downgradient: Yes, Mound and Oxnard Plain Forebay groundwater basins

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: Nitrates can fluctuate significantly in the basin, and above MCL. Other inorganics present above MCL.TDS is known to be high.

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Tierra Rejada Basin

Groundwater Basin Surface Area:	4,611 Acres (DWR, 2014)
Irrigated Acreage:	≈450 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Calleguas Creek
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation:	Tierra Rejada (4-15)
SGMA Basin Priority:	Very Low
DWR Groundwater Basin Population:	3,758 (2010)

Known Water Supply Wells (as of May 2022)

Number of Wells: 58
Active: 36
Destroyed: 9
Abandoned: 1
Can't Locate: 12

Water Demand Estimate

Irrigation Demand @ 2 AF/Ac: 900 AF/Yr

Municipal Demand @ 0.5AF/person/Yr: 1,834 AF/Yr

Total Demand Estimate: 2,734 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

No key well is in this basin.

In general, for 2 wells measured in each quarter of 2021 in the basin, water levels decreased in both wells from the 1st quarter reading to the last quarter reading in one well and declined in the other.

2021 Groundwater Quality in General for All Wells Sampled by County

(7 wells)

Five wells are magnesium bicarbonate type, one well is magnesium sulfate type and one well is calcium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/L?	Yes, 1 well
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 7 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 1 well

5 Year Groundwater Level Trend 2017 - 2021

In general for 2 wells consistently measured: (2 wells) ↓

5 Year Groundwater Quality Trend 2017-2021

SWN	Nitrate	Chloride	TDS	Sulfate
02N19W10R02S	→	→	→	→
02N19W11J03S	↓	↓	↑	↓
02N19W14F01S	↓	↓	↓	↓
02N19W15J02S	↓	↑	↑	↑

Wells are in various locations in the basin.

Sources of Groundwater Recharge

Basin Recharge: Percolation of rainfall to the valley floor, stream flow, and irrigation return.(DWR, 2006)

Potable Water Sources

Groundwater from Tierra Rejada Basin, Arroyo Santa Rosa Basin via Camrosa Water District. State Water Project water from Calleguas Municipal Water District via Camrosa Water District.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: No

Downgradient: Yes, some subsurface flow into Arroyo Santa Rosa basin.

DWR CASGEM Groundwater Basin Prioritization Level - Very Low

Impact Comments: Locally high nitrates documented in the basin (B-118).

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓

Upper Ventura River Subbasin

Groundwater Basin Surface Area:	7,430 Acres. (DWR, 2014)
Irrigated Acreage:	≈1,206 (estimate determined from Ventura County Ag Commissioner's data)
Watershed:	Ventura River
Aquifers:	Unconfined Aquifer
DWR Groundwater Basin Designation:	Ventura River Valley Basin, Upper Ventura River Subbasin (4-3.01)
SGMA Basin Priority:	Medium
DWR Groundwater Basin Population:	10,307 (2010)

Known Water Supply Wells (as of May 2022)	**Water Demand Estimate**
Number of Wells: 202	Irrigation Demand @ 2 AF/Ac: 2,412 AF/Yr
Active: 117	
Destroyed: 35	Municipal Demand @ 0.5AF/person/Yr: 7,980 AF/Yr
Abandoned: 16	
Can't Locate: 31	
Non-Compliant: 3	Total Demand Estimate: 10,392 AF/Yr

2021 Groundwater Levels in General for All Wells Gauged by County

"Key" well 04N23W16C04S - September level was down 29.0 feet from the March measurement. Well could not be measured in December.

In general, for wells measured in 2021 in the basin, water levels declined in 5 wells and rose in 2 wells over the course of the year from the 1st quarter reading to the last quarter reading.

2021 Groundwater Quality in General for All Wells Sampled by County

(3 wells)

The water in one sample is sodium bicarbonate, and two samples are calcium bicarbonate type.

Primary MCL Exceedances for Nitrate >45mg/l?	No
Secondary MCL Exceedances for Chloride >250mg/L?	No
Secondary MCL Exceedances for TDS >500mg/L?	Yes, 3 wells
Secondary MCL Exceedances for Sulfate >250mg/L?	Yes, 1 well

5 Year Groundwater Level Trend 2017 - 2021

"Key" well 04N23W16C04S: ↑

In general for 12 wells consistently measured: (9 wells) ↓ (3 wells) ↑

5 Year Groundwater Quality Trend 2017-2021

SWN	Nitrate	Chloride	TDS	Sulfate
04N23W09G03S	↑	→	↑	↑

Well is in the north part of the basain

Sources of Groundwater Recharge

Basin Recharge: percolation of flow in the Ventura River and, to a lesser extent, by percolation of rainfall to the valley floor and excess irrigation water. (DWR, 2006)

Potable Water Sources

Groundwater from Lower Ventura River basin. Surface water from Lake Casitas via Casitas MWD to various water purveyors.

Subsurface Hydrologic Connection to Other Groundwater Basins

Upgradient: No.

Downgradient: Lower Ventura River basin.

DWR CASGEM Groundwater Basin Prioritization Level - Medium

Impact Comments: TDS is known to be high in some parts of the basin (B-118)

Groundwater Quality Trend Notes: Trend is relatively flat, or no clear trend → Level trending up ↑ Level Trending down ↓