Ventura County
Watershed Protection District
Water & Environmental Resources Division

2012 Groundwater Section Annual Report

Ventura County
Watershed Protection District
Water & Environmental 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."

2012 Groundwater Section
Annual Report

Cover Photo: Agricultural well in a field of celery in the Piru Groundwater Basin.

Ventura County Watershed Protection District
Water & Environmental Resources Division
Groundwater Section

2012 GROUNDWATER SECTION ANNUAL REPORT

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Executive Summary

Calendar year 2012 was a very dry year. The 2012 average precipitation value for the entire County was just under 11 inches; in contrast, the average precipitation value for the year 2011 was approximately 24 inches. The 17 year average rainfall amount is approximately 20 inches.

Despite the low amount of precipitation, groundwater levels in the 16 key wells did not decline in every basin. Water levels increased in seven basins an average of approximately 5 feet, with a maximum water level increase of 13.5 feet in the East Las Posas Basin. Water levels decreased in eight basins an average of approximately 10 feet, with a maximum water level decrease of 30.5 feet in the Oxnard Forebay. In some groundwater basins, water levels are consistently below sea level.

The County's water quality data for 2012 (168 wells sampled) was collected between August and November. It indicates groundwater from 26 of the 168 wells exceeded the State of California's maximum contaminant level (MCL) for nitrate. Data from some wells in the Tierra Rejada and Arroyo Santa Rosa Basin show nitrate concentrations consistently above the MCL. Other basins include wells that may produce water exceeding the MCL for nitrate (Fillmore, East Las Posas, Oxnard Plain). Some basins have wells that produce water containing elevated levels of chloride, sulfate, and TDS.

The volume of water delivery from the three wholesale districts in the County increased approximately 6% from the previous year. The volume of groundwater extractions reported in the Fox Canyon Groundwater Management Agency increased approximately 5% from the previous year.

We would also like to thank the hundreds of private and public well owners that make their wells available to the County for water level and water quality measurement.

Section 1.0
Introduction

The 2012 Groundwater Section Annual Report is a summary of this year's accomplishments, while also providing an overview of the groundwater conditions for the County for the past calendar year.

1.1 – Summary of Accomplishments

Over the last 12 months the Groundwater Section:

- Issued 130 various types of well permits, including 43 for new water supply wells, 9 water supply well destructions and 9 for water supply well repairs or modifications. Sixty-one inspections of sealing and perforation work were performed by Groundwater Staff.

- Sampled 168 wells as part of the annual groundwater sampling program. Analytical results are included in Section 3 and Appendix D.

- Measured the water level, quarterly, in approximately 200 wells countywide. Approximately 50% of the groundwater levels measured during spring 2012 were higher than the 2011 Spring measurement and approximately 50% of the groundwater levels had declined from the Spring 2011 measurement levels.

- Completed potentiometric surface maps for the Santa Clara River Valley, Upper Aquifer System and Lower Aquifer System for 2012

- Created numerous new maps and map layers using ArcView GIS.

- Assisted the Fox Canyon Groundwater Management Agency (FCGMA) and other departments and Agencies with groundwater and mapping needs.

- Facilitated the development of a Salt & Nutrient Management Plan for the Lower Santa Clara River Groundwater Basins. Piru, Fillmore, Santa Paula and Mound. Applied for Prop 84 Focused Planning Grant to assist with plan development.

- Compiled water level data gathered by Groundwater Staff with that gathered by other agencies and uploaded it to the CASGEM website semi-annually to maintain compliance with the State CASGEM program.

- Added water level measurement wells in the Lower Ventura River Basin and the Cuddy Valley Basin to complete basin designation for all groundwater basins in Ventura County for the CASGEM program.

- Completed and published the 2011 Groundwater Section Annual Report.

1.2 - General County Information

The following sections contain a general overview regarding climate, population, surface water and changes in groundwater conditions in Ventura County for 2012.

1.2.1 - Population and Climate

On July 1, 2012, the California State Department of Finance estimated Ventura County's population to be 834,109, an increase of 0.47 percent over the revised 2011 population estimate of 830,215. The City of Santa Paula had the largest estimated percentage increase in population (1.4 percent) over the previous year. The mean annual daily air temperature at the National Weather Service Oxnard area office was 61.1[1] degrees Fahrenheit, with an average daily high of 70.9[1] degrees Fahrenheit and an average low of 51.4[1] degrees Fahrenheit. The average annual rainfall, countywide (based on preliminary data from all active rain gages), was approximately 11 inches for the 2011/2012 water year[2]. Throughout the County, precipitation for the 2011/2012 water year was between 53 and 68 percent of normal, with Ojai receiving 53% of normal, while the Camarillo area received 68% of the normal rainfall total. Figure 1-1 below shows various rain gage/area rainfall totals comparing water year 2011/2012 to normal precipitation totals for that gage/area. Normals are determined from the 1957-1992 base period (i.e. the most recent 35 year period that represents average rainfall from gages with 80-120 years of record).

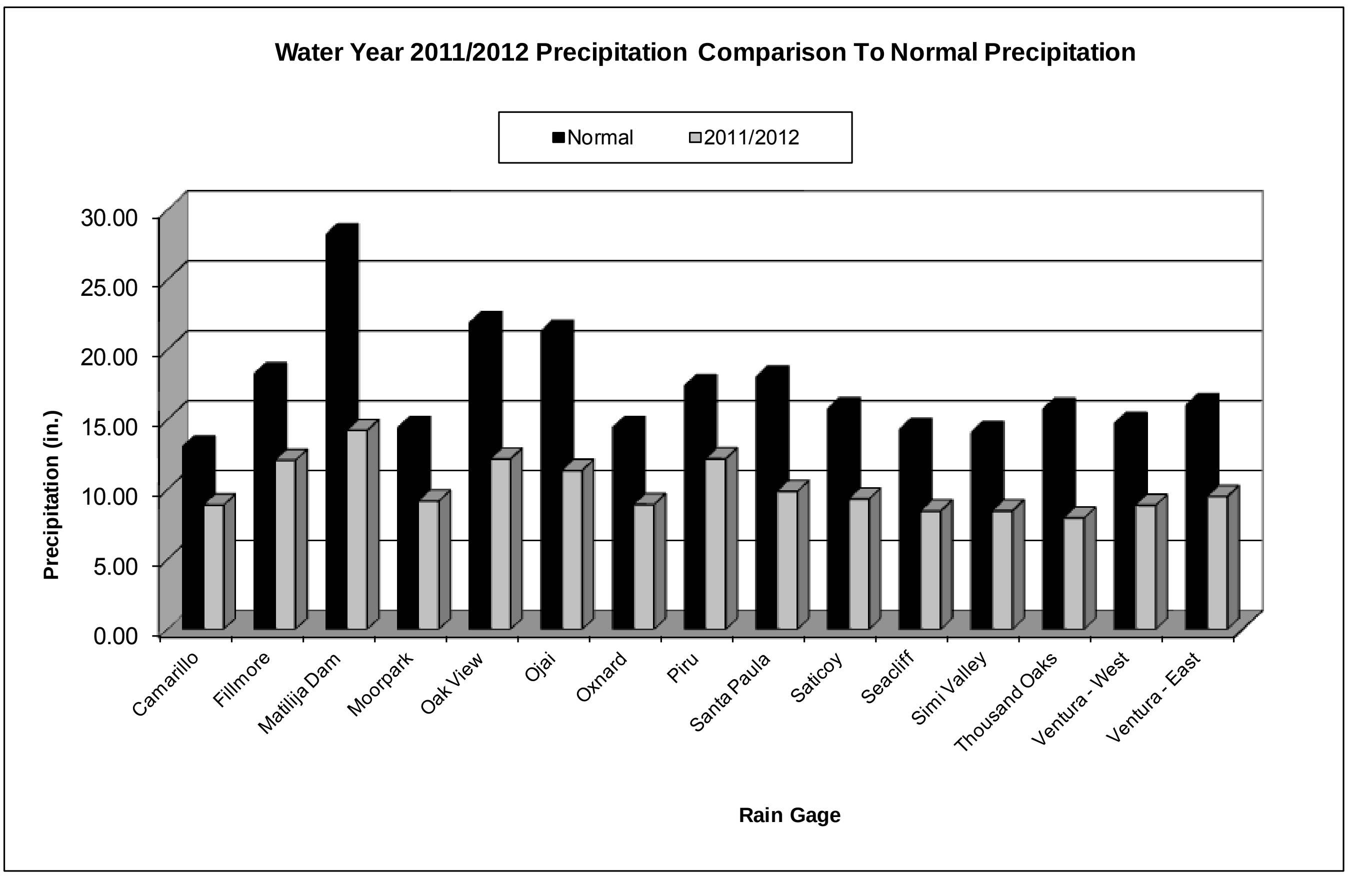


Figure 1-1: Chart comparing 2011/2012 rainfall totals to normal rainfall totals for the same area.

1 Based on *preliminary* data from the National Climatic Data Center http://www.ncdc.noaa.gov.
2 Water Year defined as: October 1 to September 30 of the following year. VCWPD precipitation data is *preliminary* and subject to change.

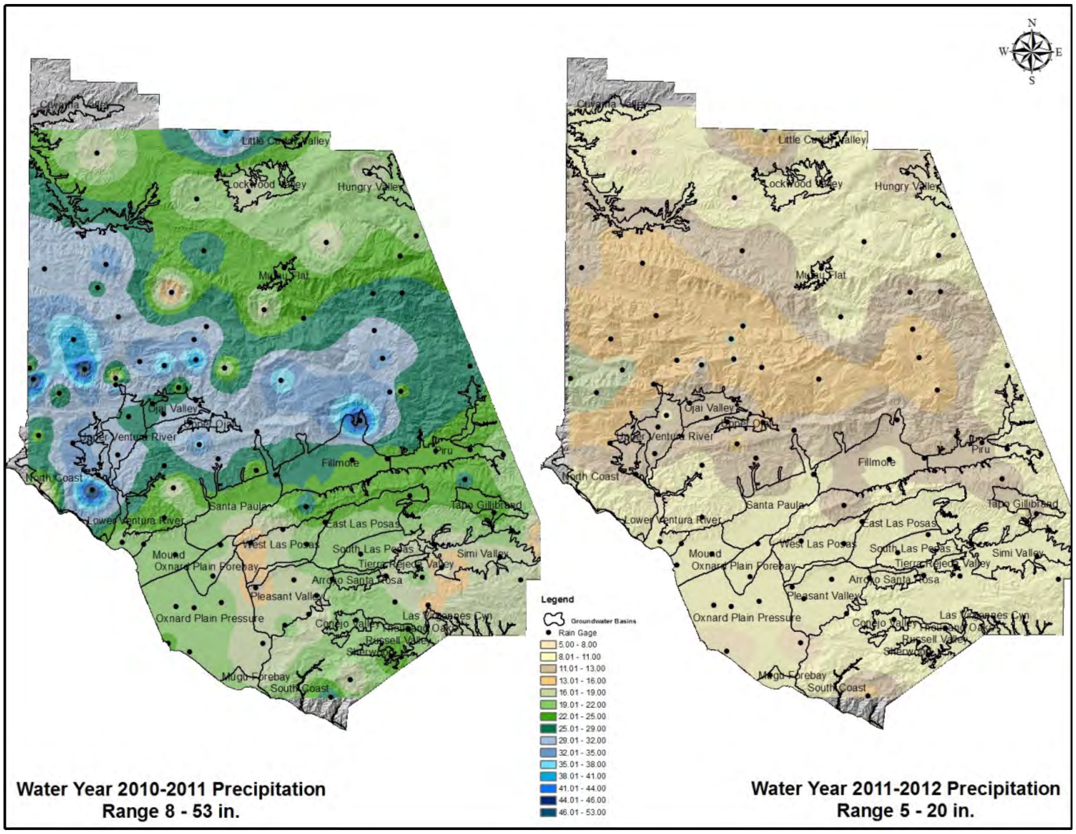


Figure 1-2: Generalized map[3] comparing precipitation between water years 2010/2011 and 2011/2012.

The map above (Figure 1-2) shows a generalized distribution of rainfall across the county for water years 2010/2011 and 2011/2012. The chart below (Figure 1-3) depicts average rainfall for the period 1995/1996 to 2011/2012 for all of Ventura County.

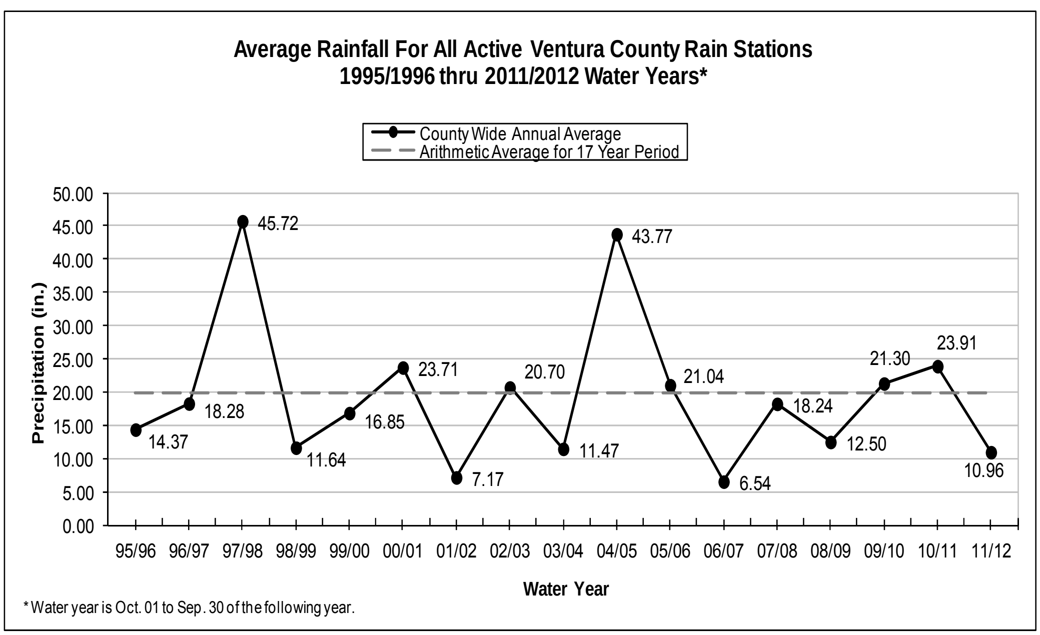


Figure 1-3: Chart comparing the average annual rainfall for Ventura County.

[3] Based on data from all active Ventura County rain gages. Data is *preliminary* and subject to change.

1.2.2 – Surface Water

In calendar year 2012 United Water Conservation District (UWCD) released 30,183[4] acre feet (AF) of water from Lake Piru, which includes a fish passage requirement of 5 cubic feet per second (cfs) per day. UWCD diverted 37,036[4] AF from the Santa Clara River at the Freeman Diversion Dam with 3,985[4] AF sent to the Saticoy Spreading Grounds, 16,293[4] AF sent to the El Rio Spreading Grounds and 538[4] AF sent to the Noble pit, with some surface water also going to agricultural customers through the Pumping Trough Pipeline (PTP) and the Pleasant Valley Pipeline (PVP). At the end of 2012 there was 20,294[4] AF of water in storage in Lake Piru, 183,134[5] AF in Lake Casitas and 10,080[6] AF in Lake Bard. Casitas Water District releases 3,200 AF per year from Lake Casitas for the Robles Diversion Fish Passage.

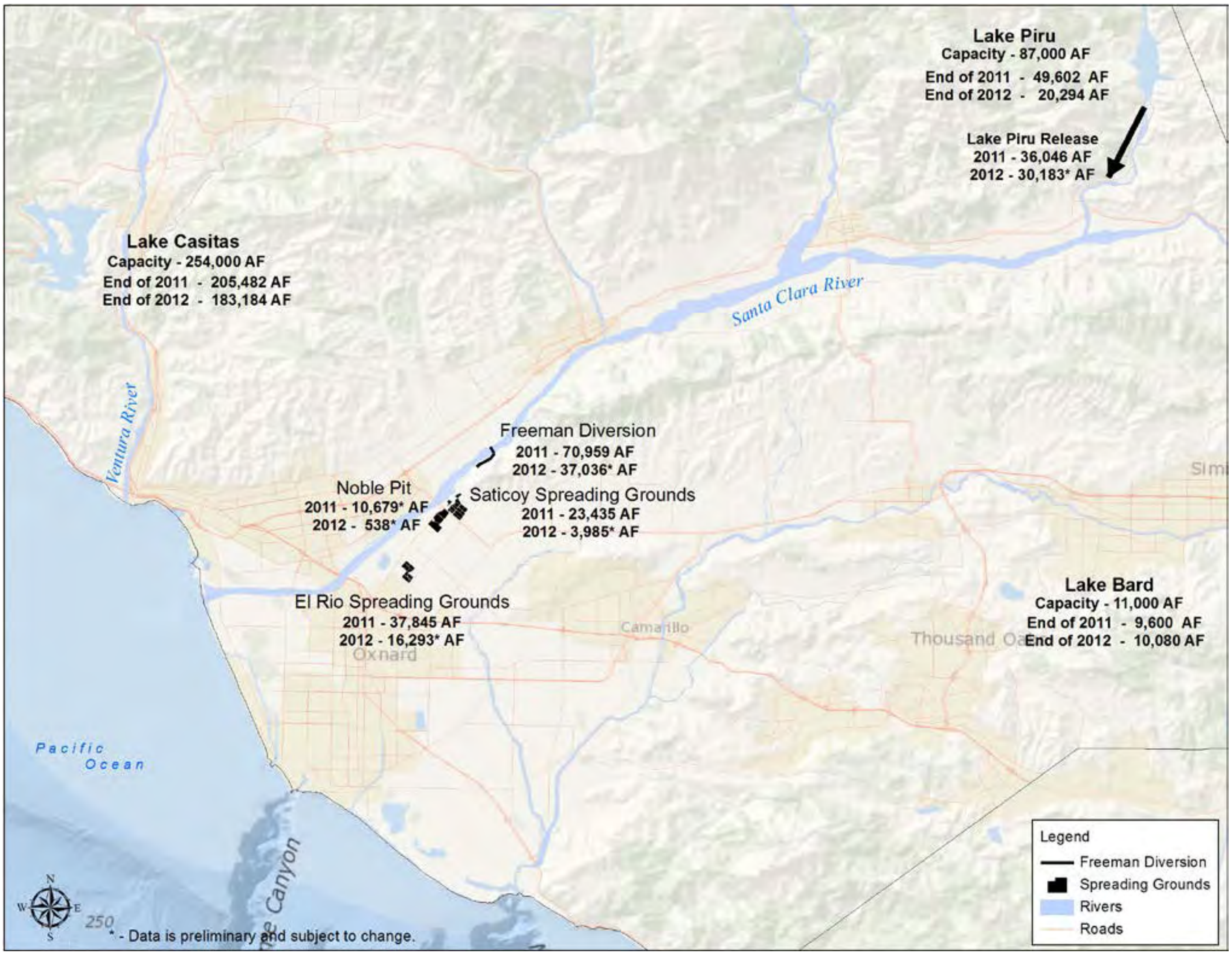


Figure 1-4: Map showing lake storage at the end of 2012 and Santa Clara River diversions.

1.2.3 – Groundwater

The majority of accessible groundwater is found in 32 groundwater basins within Ventura County. The groups of basins that make up the Santa Clara-Calleguas hydrologic unit contain the largest

[4] Data provided courtesy of UWCD is preliminary and subject to change per UWCD. Freeman diversion data from UWCD operations logs.
[5] Data provided courtesy of Casitas MWD.
[6] Data provided courtesy of Calleguas MWD.

groundwater reserves in the County. The Groundwater Section of the Ventura County Watershed Protection District, the United Water Conservation District, dozens of individual water purveyors, and to a lesser extent the United States Geological Survey, all collect data to provide information concerning the status of groundwater in the County. Recharge of groundwater occurs naturally from infiltration of rainfall and river/streamflow, artificially through injection of imported water (Calleguas Municipal Water District) and spreading of diverted river water into recharge basins (United Water Conservation District).

Figure 1-5: Map showing groundwater basins in Ventura County.

Section 2.0
Duties and Responsibilities

2.1 – Well Ordinance
2.1.1 – Permits

The Groundwater Section issues permits for wells and engineering test holes throughout the County, except within the City of Oxnard. The Groundwater Section conditioned and issued 130 permits for wells and engineering test holes during calendar year 2012. Table 2-1 below shows the total number of permits issued for the year by type of permit. Figure 2-1 below shows the total number of permits issued per year for the period 2002 to 2012.

Table 2-1: Permits issued by type for calendar year 2012.

Type of Work	Engineering Test Hole	Monitoring Well – Destruction	Monitoring Well – New	Water Supply Well – New	Water Supply Well – Destruction	Water Supply Well - Repair	Cathodic Protection Well	**TOTAL**
Number 2012	24	25	15	43	9	9	5	130

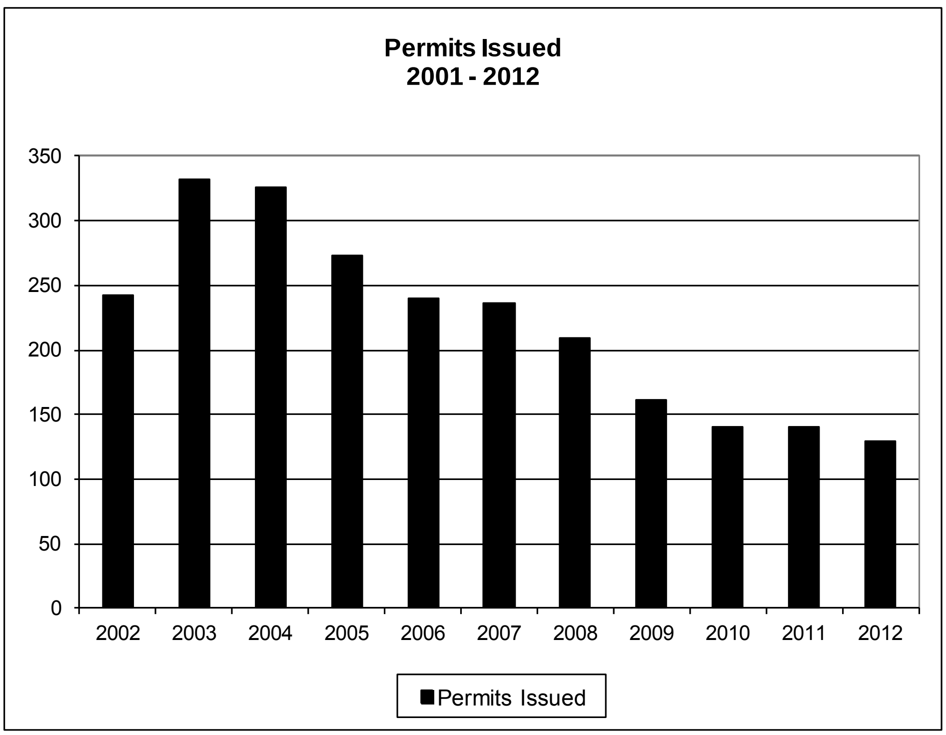


Figure 2-1: Permits issued for the period 2001 to 2012.

2.1.2 – Inspections

Groundwater Section staff perform inspections on all well perforation and sealing work for each new water supply well, well destruction, new cathodic protection well or destruction, and major modifications or repairs to existing water supply wells per the County's Well Ordinance. In 2012, staff performed 61 inspections throughout the County. Figure 2-2 on the following page shows the distribution of new well and well destruction locations inspected by Groundwater staff during 2012.

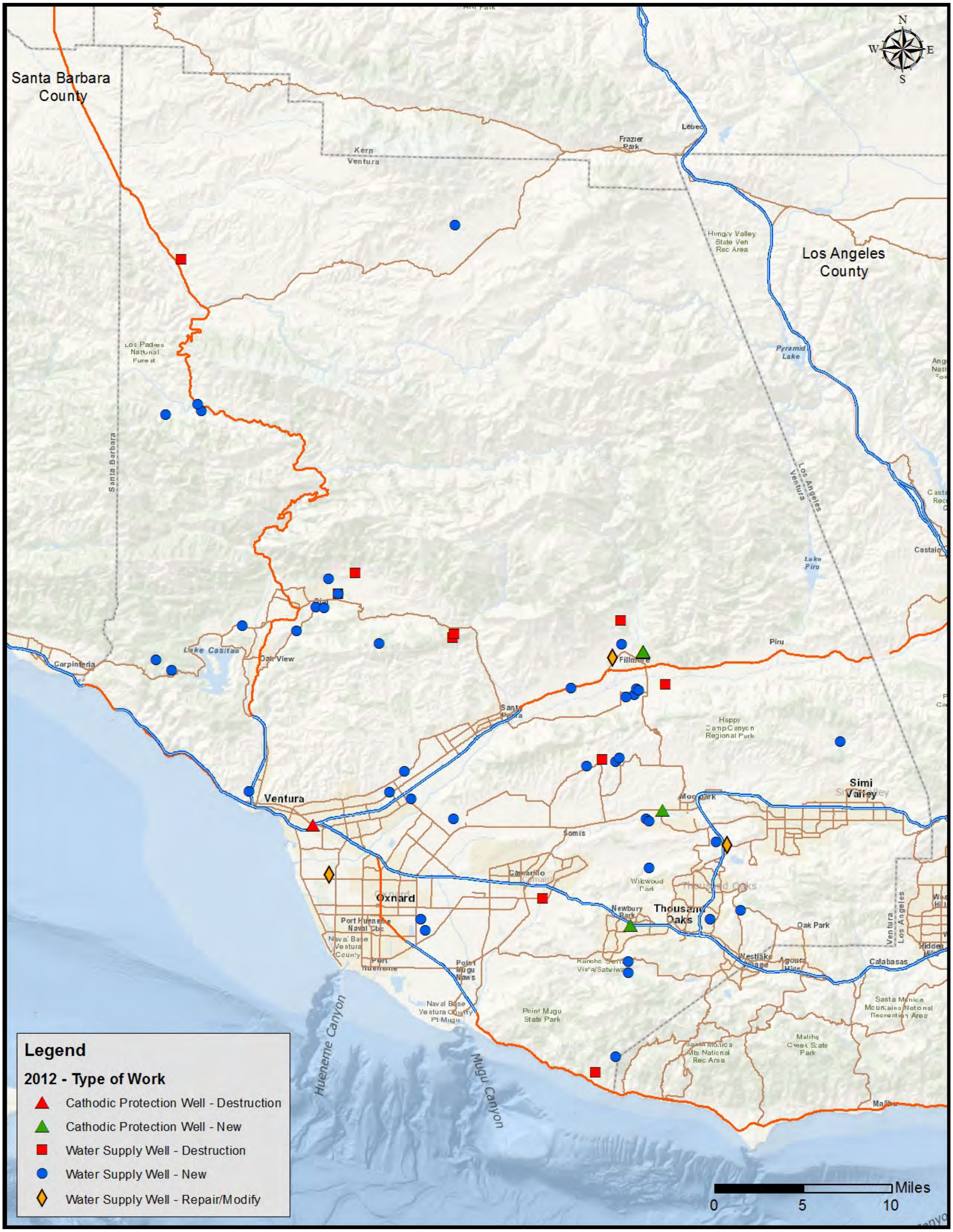


Figure 2-2: Location of well inspections in 2012.

2.2 – Inventory & Status of Wells

The Groundwater Section maintains an inventory of wells in a database that includes the status of all wells within Ventura County. The database contains details for wells of all types including water supply wells, long-term monitoring wells, cathodic protection wells, and also springs that were given a state well number. At the end of 2012 there were 8,863 well records in the database in the following categories.

2012 Status	Number
Active	3,868
Abandoned	430
Can't Locate	1,808
Non Compliant	98
Non Compliant Abandoned	153
Destroyed	2,492
Exempt	14

Active wells are those wells that meet or exceed the minimum requirement of 8 hours pumping per calendar year as described in the County of Ventura Well Ordinance No. 4184. Abandoned wells are those wells that do not meet the 8 hour minimum usage requirement or are in a condition that no longer allows the well to be used. There are several reasons why a well may be listed as "Can't Locate". Generally, though, "Can't Locate" wells are old rural wells for which the Groundwater Section has historic well location data but the locations are now in areas that have subsequently been urbanized. The current owner of the property where the historical well was understood to be located may be unaware of the existence of a well on his/her property, or an approved search has been conducted and no well has been found. Non Compliant wells are generally active wells where the owner of the well has failed to respond to written communication from the Groundwater Section. Non Compliant Abandoned wells are those wells where the owner of an abandoned well has failed to respond to written communication from the Groundwater Section to take action on an inactive well. The County's Well Ordinance prohibits anyone from owning an abandoned well. Abandoned wells pose a safety risk and may also act as a potential pathway for contaminants to reach groundwater. Destroyed wells are wells that have been verified to no longer be in existence or wells that have been properly destroyed under permit. Exempt wells are wells that have been found to be in good enough condition to remain inactive for a period of 5 years before being re-activated or re-inspected. To be listed as exempt a well inspection report, from a registered geologist or civil engineer, and application fee must be submitted by the well owner to the Groundwater Section for review and approval.

Section 3.0
Groundwater Quality

3.1 – Water Quality Sampling

The Groundwater Section collects data and performs studies as needed for purposes of groundwater resource assessment and management. In 2012, Groundwater staff sampled a total of 168 wells throughout the county. All samples were analyzed for general minerals under the Irrigation Suitability suite (see Appendix Laboratory methods). Analyses were conducted by Fruit Growers Laboratory in Santa Paula. Title 22 metals were also analyzed on select samples under the Inorganic Chemical Suite and four samples were analyzed for Gross Alpha particles. Analytical results were entered into the Section's database and used to describe the chemistry of groundwater in the basins sampled. Complete results are listed in Appendix D, and interpretations are detailed in the following sub-sections. Wells sampled in the south half of the County are shown below in Figure 3-1. Wells sampled in the north half of the County are shown on the following page in Figure 3-2.

More groundwater quality data is available that was not used in this report from other sources, including data from water district's and agencies that collect and analyze groundwater samples for their own use. Organic groundwater chemistry data is also available for some areas of the county through the State Regional Water Quality Control Board's Geotracker website for environmental cleanup sites overseen by the SRWQCB and the County of Ventura Environmental Health Division.

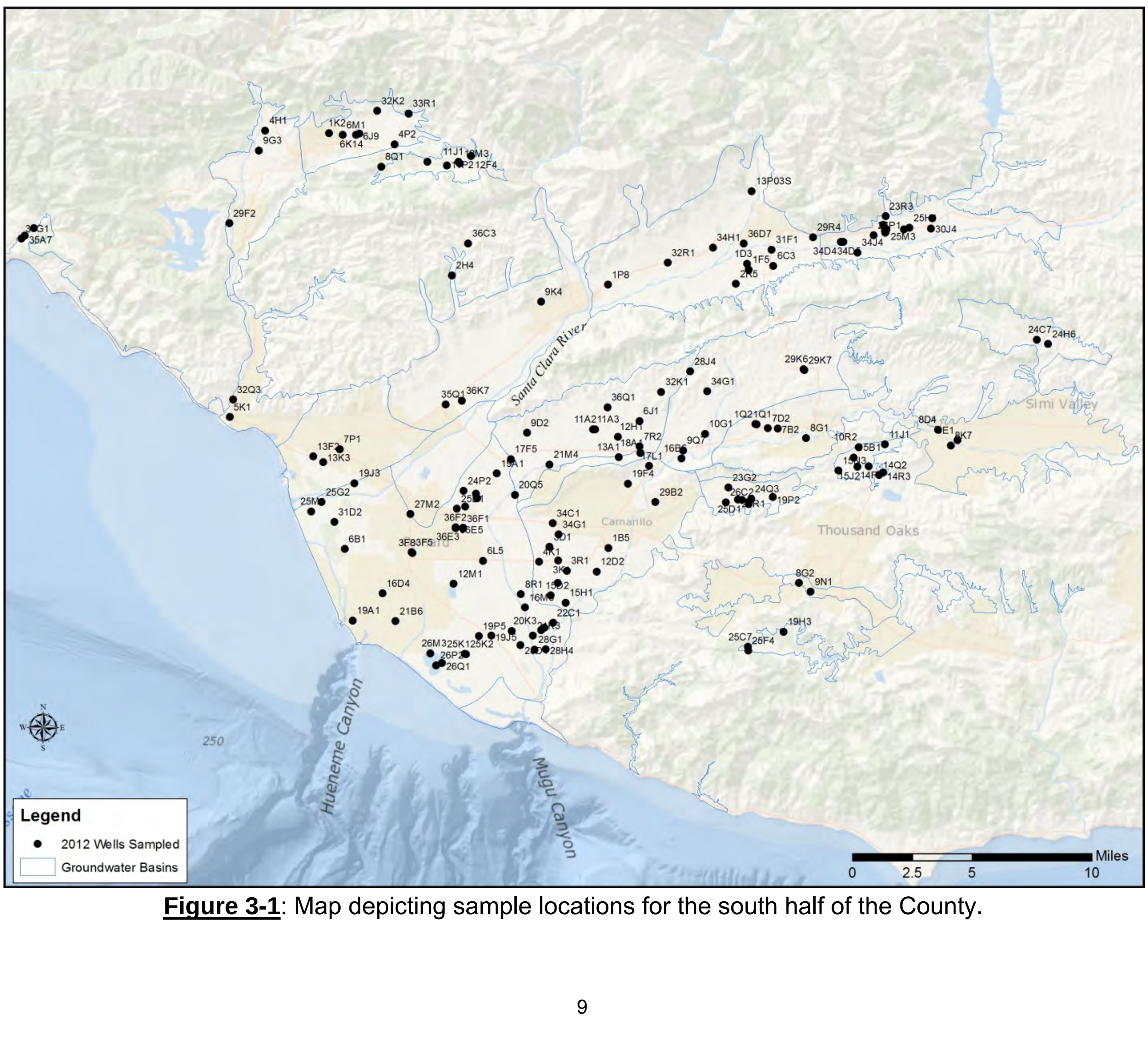


Figure 3-1: Map depicting sample locations for the south half of the County.

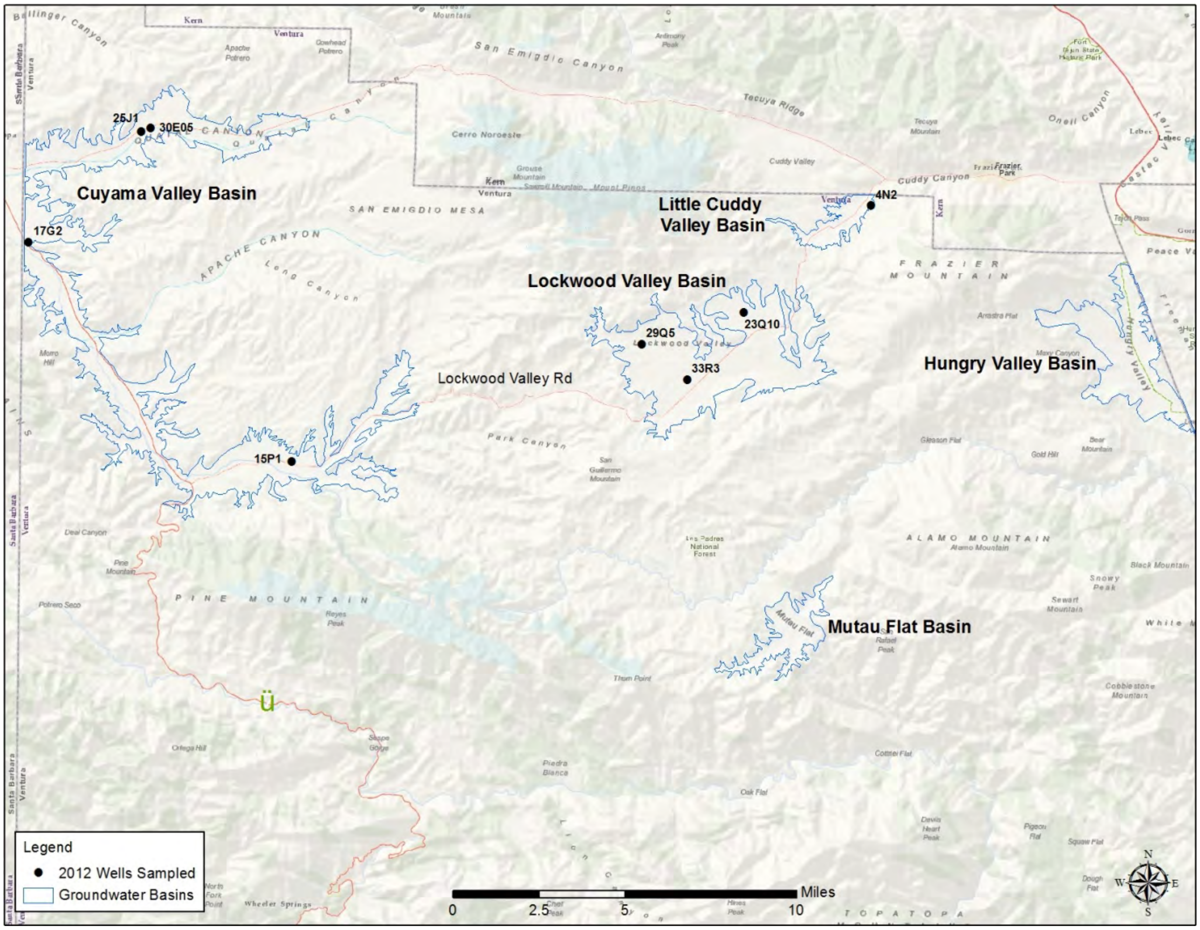


Figure 3-2: Map depicting sample locations for the northern half of the County.

3.2 – Current Conditions

A summary of the groundwater quality results for each groundwater basin sampled this year is included in this section. Basin summaries are presented in order from largest to smallest total available storage capacity as reported in California Department of Water Resources Bulletin No. 118. Ventura County groundwater, in general, has slightly high TDS. Several areas are nitrate impacted (meaning Basin Management Objectives for nitrate are exceeded) and some areas have high concentrations of sulfate and total dissolved solids.

The Groundwater Section has adopted the United States Environmental Protection Agency (EPA) National Drinking Water Regulations and California Code of Regulations (CCR) Title 22, Section 64431 (Table 3-1 below) for describing groundwater quality in Ventura County relative to maximum contaminant levels (MCL). National Primary Drinking Water Regulations, or primary standards, are legally enforceable standards that apply to public water systems. Primary standards protect public health by limiting the levels of contaminants in drinking water. Maximum contaminant level or MCL is the highest level of a contaminant allowed in drinking water by the United States Environmental Protection Agency. MCLs are set as close as feasible to the level that below which there is no known or expected health risk. National Secondary Drinking Water Regulations, or secondary standards, are guidelines for contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water. The EPA recommends secondary standards to water systems but does not require systems to comply with the secondary standards. However, states may choose to adopt the secondary standards as enforceable standards. CCR, Title

22, Section 64431 lists MCLs for inorganic chemicals adopted by the State of California. In order to be certified as a permanent domestic or municipal water supply, water from wells located in the County of Ventura must meet these standards.

Table 3-1: U.S. Environmental Protection Agency Primary and Secondary Standards and California Code of Regulations, Title 22 Maximum Contaminant Levels (February 2012).

Primary Contaminants	**Chemical Formula**	**EPA MCL (mg/l)**	**CCR, Title 22 MCL (mg/l)**
Antimony	Sb	0.006	0.006
Arsenic	As	0	0.01
Asbestos		7 MFL[1]	7 MFL[1]
Barium	Ba	2	1
Beryllium	Be	0.004	0.004
Cadmium	Cd	0.005	0.005
Chromium	Cr	0.1	0.05
Copper	Cu	1.3	
Cyanide		0.2	0.15
Fluoride	F^-	4	2
Lead	Pb	0	
Mercury	Hg	0.002	0.002
Nitrate (as Nitrogen)	N	10	10
Nitrate[2]	NO_3^-		45
Nitrite (as Nitrogen)	N	1	1
Selenium	Se	0.05	0.05
Thallium	Tl	0.0005	0.002
Secondary Contaminants			
Aluminum[3]	Al	0.5 to 0.2	
Chloride	Cl^-	250	
Iron	Fe	0.3	
Manganese	Mn	0.05	
pH		6.5-8.5	
Silver	Ag	0.1	
Sulfate	SO_4^{2-}	250	
Total Dissolved Solids	TDS	500	
Zinc	Zn	5	

[1] MFL = Million fibers per liter longer than 10 um

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

[3] CCR, Title 22 lists Aluminum as a primary contaminant

The piper diagram, shown at the bottom of each basin map, is used to graphically present various types of water and is drawn based on chemical composition of water. The piper diagrams show the percentage composition of nine ions. Cations (calcium, sodium + potassium, and magnesium) are plotted on one triangle and anions (chloride + fluoride, sulfate and bicarbonate + carbonate) on another with the apex representing 100 percent concentration of one of the constituents. The diamond-shaped field between the two triangles represents the composition of the water with respect to both cations and anions. A second method to present results is a Stiff diagram. The same cations and anions that are plotted in the piper diagrams are also shown in the Stiff diagrams. The ions are plotted on either side of a vertical axis in milliequivalents per liter, cations on the left of the axis and anions on the right. The polygonal shape created is useful in making a quick visual comparison between water from different sources. Stiff diagrams for wells sampled this year are included on each basin map.

3.2.1 - Oxnard Plain Pressure Basin

The Oxnard Plain Pressure Basin is the largest and most complicated, hydraulically and hydrologically of the groundwater basins in Ventura County. The Oxnard Plain Pressure Basin consists of two major aquifer systems. The Upper Aquifer System (UAS) consists of the Perched, Semi Perched, Oxnard, and Mugu aquifers. Of the UAS aquifers, only the Oxnard and Mugu aquifers are sampled for water quality by the County. The Lower Aquifer System (LAS) consists of the Hueneme, Fox Canyon and Grimes Canyon aquifers. There are approximately 1560 water supply wells in the Oxnard Plain Pressure Basin; 502 are active. There are no wells perforated solely in the Grimes Canyon aquifer so we cannot sample it specifically. The basin map in Figure 3-3 shows approximate well locations and (in call out boxes) concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Upper Aquifer System of the Oxnard Plain Pressure Basin. Figure 3-4 shows the same information for wells sampled in the Lower Aquifer System.

3.2.1.1 - Oxnard Aquifer (UAS)

The Oxnard aquifer is the shallowest of the confined aquifers. The Oxnard aquifer is the most developed production zone based on the number of wells. Average depth to the main water bearing material is 80 feet making it the easiest and least expensive aquifer in which to construct a water supply well. The piper diagram Figure 3-3 shows calcium (Ca^+) is the major cation and sulfate (SO_4^{2-}) is the major anion. Groundwater samples were collected from twelve wells in the Oxnard Aquifer. A comparison of the stiff diagrams with those from the 2011 report shows no significant change in water quality.

Water from two of the wells has a concentration of iron (Fe) above the secondary MCL for drinking water. Samples from all twelve of the wells have sulfate (SO_4^{2-}) above the secondary MCL for drinking water with an average value of 668 mg/L. Total dissolved solids (TDS) ranged from 1040 to 2480 mg/l with an average value of 1461 mg/l. Water from three of the wells sampled had nitrate (NO_3^-) concentrations above the primary MCL for drinking water. A sample from one well was analyzed for inorganic chemicals (Title 22 metals); all inorganic constituents were below the primary MCL for drinking water.

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

3.2.1.2 - Mugu Aquifer (UAS)

The Mugu aquifer is the lowest layer of the UAS and has similar physical and chemical characteristics to the Oxnard Aquifer, but has slightly better water quality, in part, because with increasing depth contaminants are generally less likely to infiltrate. This is shown graphically in the piper and stiff diagrams, Figure 3-3. Average depth to the main water bearing material is 200 ft. Three wells that are perforated only in the Mugu aquifer were sampled. TDS ranges from 925 to 1570 mg/l with an average of 1161 mg/l. The piper diagram Figure 3-3 shows calcium (Ca^+) is the major cation and sulfate (SO_4^{2-}) is the major anion. One well sampled has sulfate concentrations above the secondary MCL for drinking water, one well has iron concentration above the secondary MCL and one sample has nitrate above the primary MCL. No water sample from a well perforated solely in the Mugu was analyzed for inorganic chemicals.

Two wells in the southern part of the Oxnard Plain Pressure basin that are perforated in both the Oxnard and Mugu aquifers have extremely elevated chloride (Cl^-) concentrations. It is possible these elevated concentrations are an indication of sea water intrusion in the Upper Aquifer System.

OXNARD PLAIN PRESSURE BASIN
Upper Aquifer System

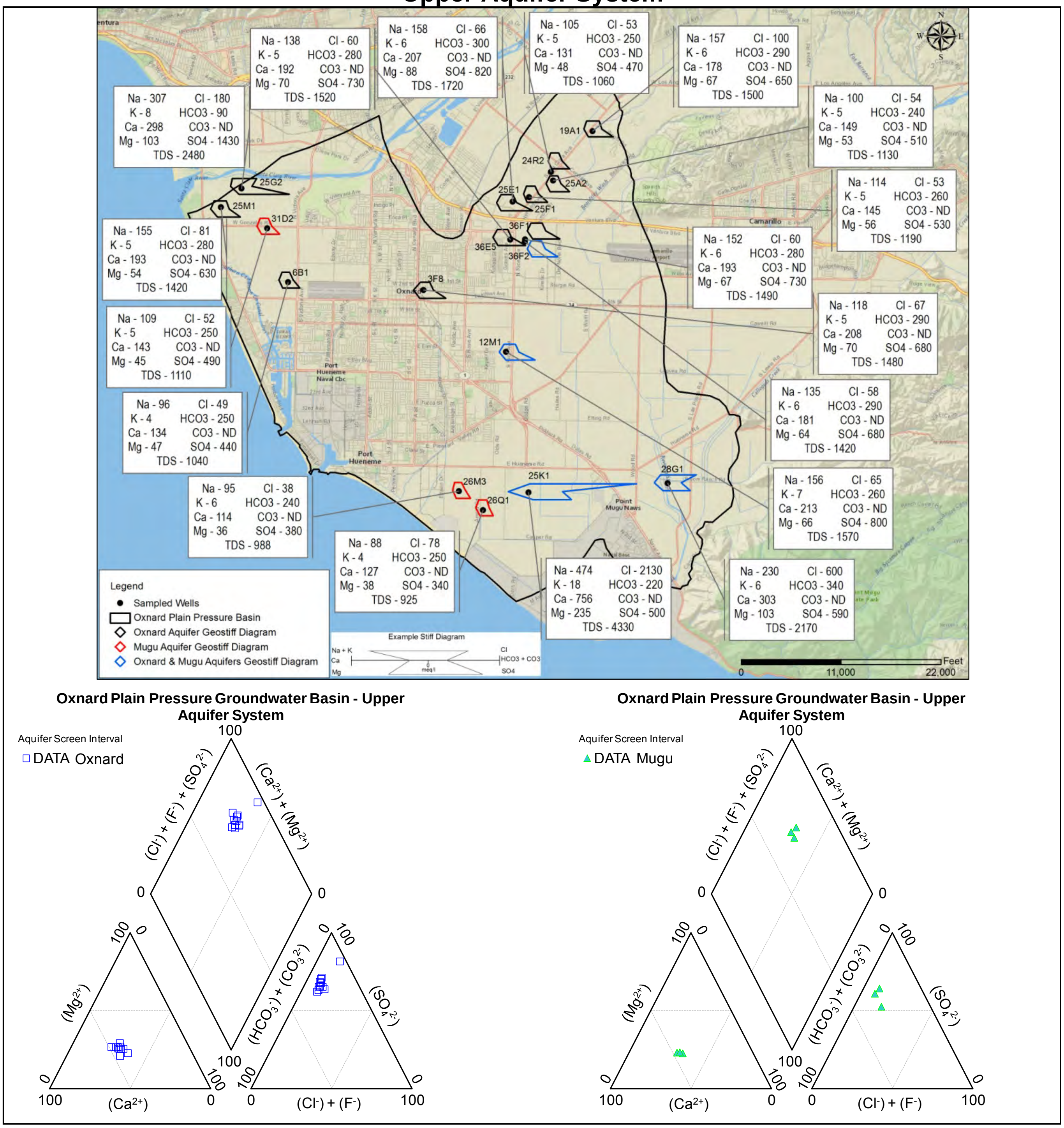


Figure 3-3: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams for each aquifer.

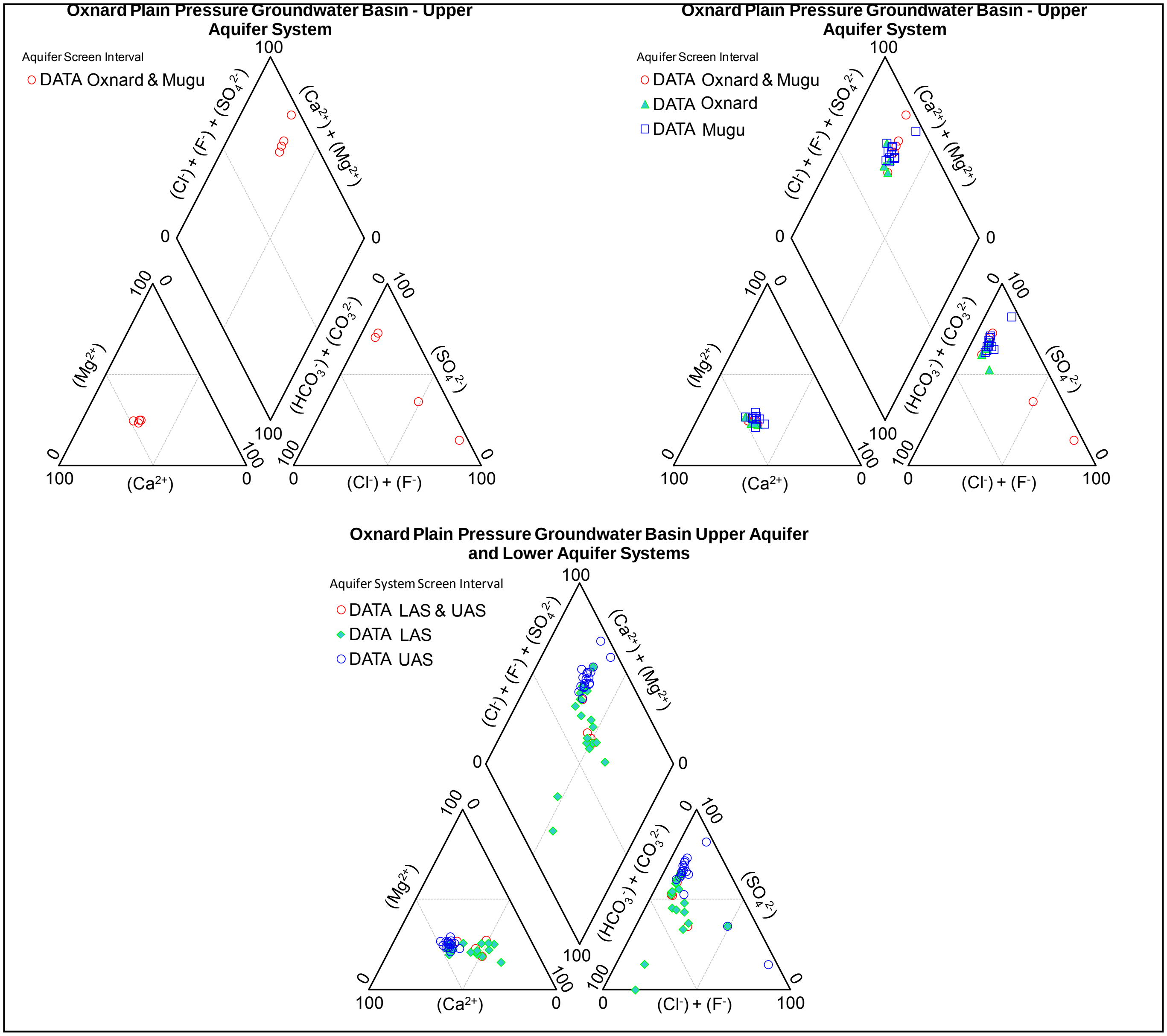


Figure 3-3 (cont.)

3.2.1.3 - Hueneme Aquifer (LAS)

The Hueneme aquifer is the shallowest of the Lower Aquifer System aquifers with depth to the main water bearing material approximately 375 feet. Very few wells are perforated exclusively in the Hueneme aquifer, making an accurate determination of water quality for the aquifer difficult. The historical average TDS concentration is 1180 mg/l. Two wells screened solely in the Hueneme were sampled this year. The piper diagram Figure 3-4 shows calcium (Ca^{+}) is the major cation and sulfate (SO_4^{2-}) is the major anion. Both have elevated TDS concentrations compared to the secondary MCL for drinking water. Overall, water quality has not changed significantly since the previous round of sampling.

3.2.1.4 - Fox Canyon Aquifer (LAS)

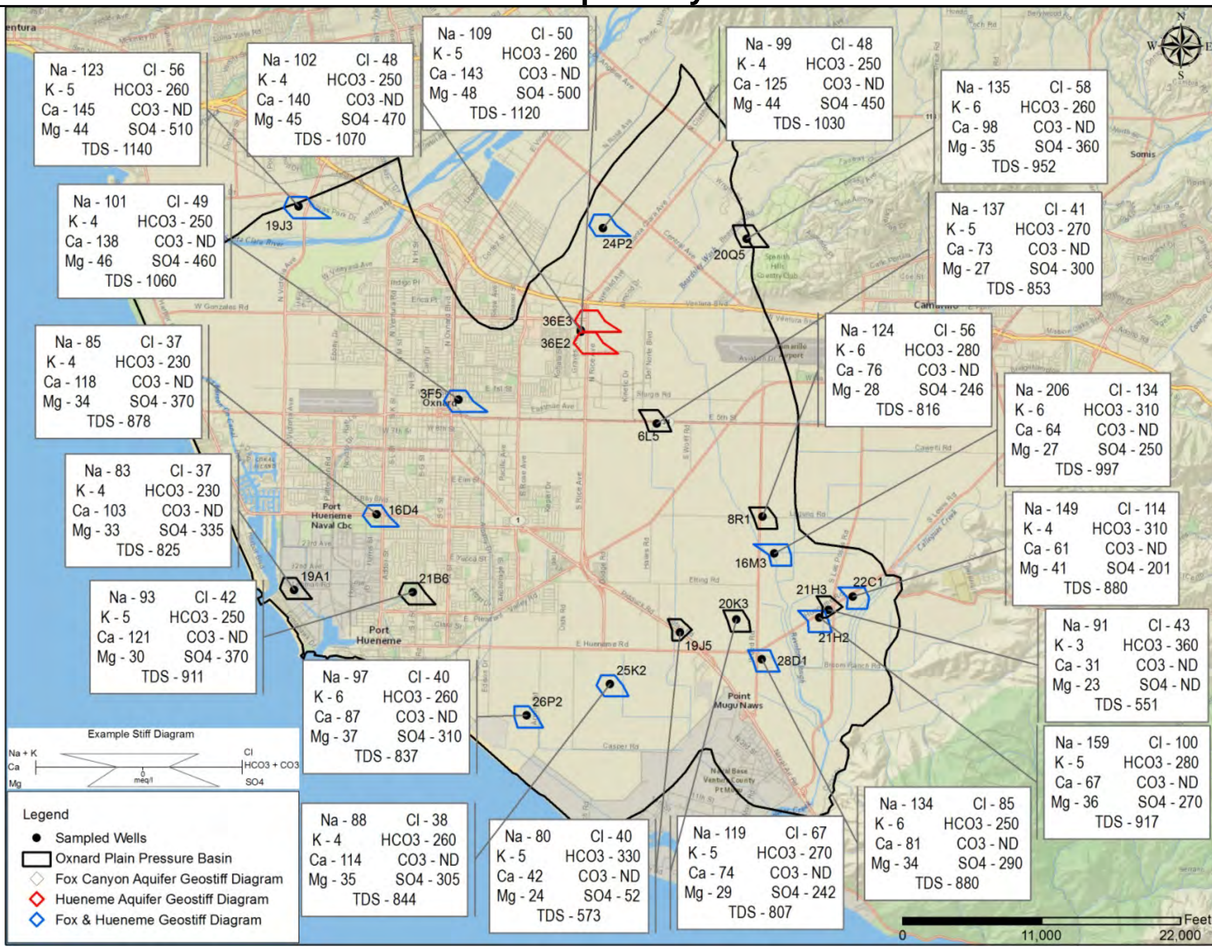
The Fox Canyon aquifer is the second most developed production zone in the Oxnard Plain Pressure Basin based on the number of wells and depth of perforations. Depth to the main water bearing material is approximately 580 feet. The Fox Canyon aquifer generally has excellent water quality and high yield rates, but is subject to seawater intrusion near Point Mugu and the Hueneme Submarine Canyon. Extractions are monitored and allocated by the Fox Canyon Groundwater Management Agency in order to mitigate aquifer overdraft and reduce the intrusion of seawater. Of the wells perforated solely in the Fox Canyon Aquifer that were sampled this year, TDS concentrations varied from 551 mg/l to 911 mg/l with an average TDS of 762 mg/l and three water samples have a manganese concentration above the secondary MCL for drinking water. No Fox Canyon Aquifer sample was analyzed for inorganic chemicals (Title 22 metals).

Twelve of the Oxnard Plain Pressure Basin wells that were sampled this year are perforated in both the Hueneme aquifer and the Fox Canyon aquifer and will be referred to as the LAS wells. Results for those wells are included in Appendix D and shown in blue on the map of the Lower Aquifer System (LAS) Figure 3-4 and in the third piper diagram in Figure 3-4. The TDS concentration of water from these wells varies between 792 mg/l and 1140 mg/l with an average of 934 mg/l for wells sampled this season. Samples from four LAS wells have iron concentrations above the secondary MCL for drinking water, four have manganese above the secondary MCL for drinking water, and ten have sulfate above the secondary MCL. Water samples from three of the LAS wells were analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents were well below the primary MCL for drinking water. Based on an examination of the piper diagrams, the water samples from the LAS wells tend to have chemistry more closely related to the wells perforated solely in the Hueneme Aquifer.

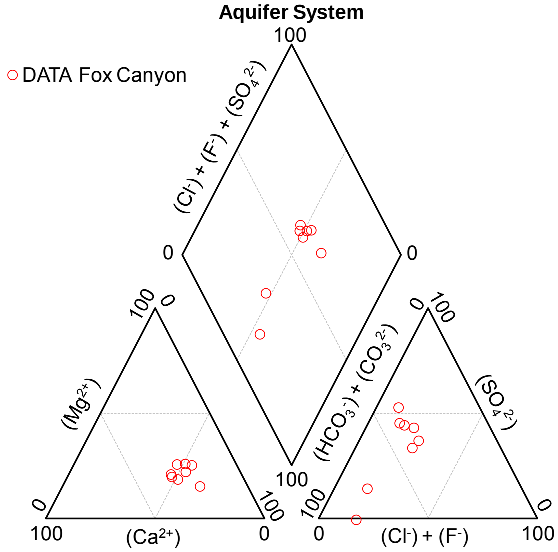
Fox Canyon wells sampled this year tend to produce groundwater with sodium as the dominant cation, but do not appear to have a dominant anion. Piper diagrams show that the water chemistry of the Fox Canyon Aquifer has more variation between wells, but overall the chemistry of water samples from the cross-screened wells is very similar to water samples from the wells screened in the Hueneme aquifer. Three samples were analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents were well below the primary MCL for drinking water.

Aerial photo showing the extent of the Oxnard Pressure Plain groundwater basin.

OXNARD PLAIN PRESSURE BASIN
Lower Aquifer System



Oxnard Plain Pressure Groundwater Basin - Lower Aquifer System



Oxnard Plain Pressure Groundwater Basin - Lower Aquifer System

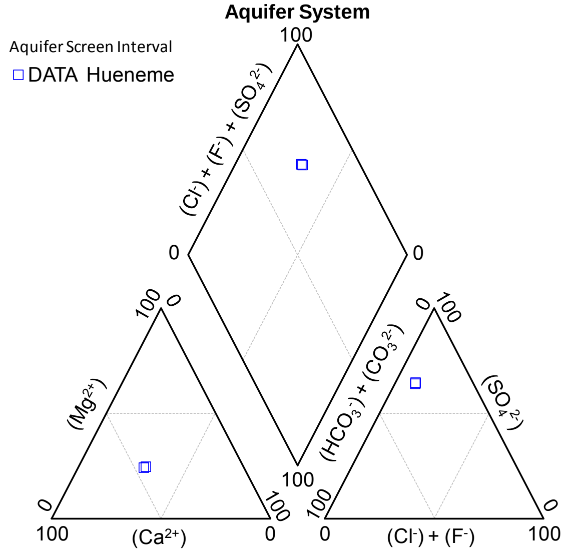


Figure 3-4: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

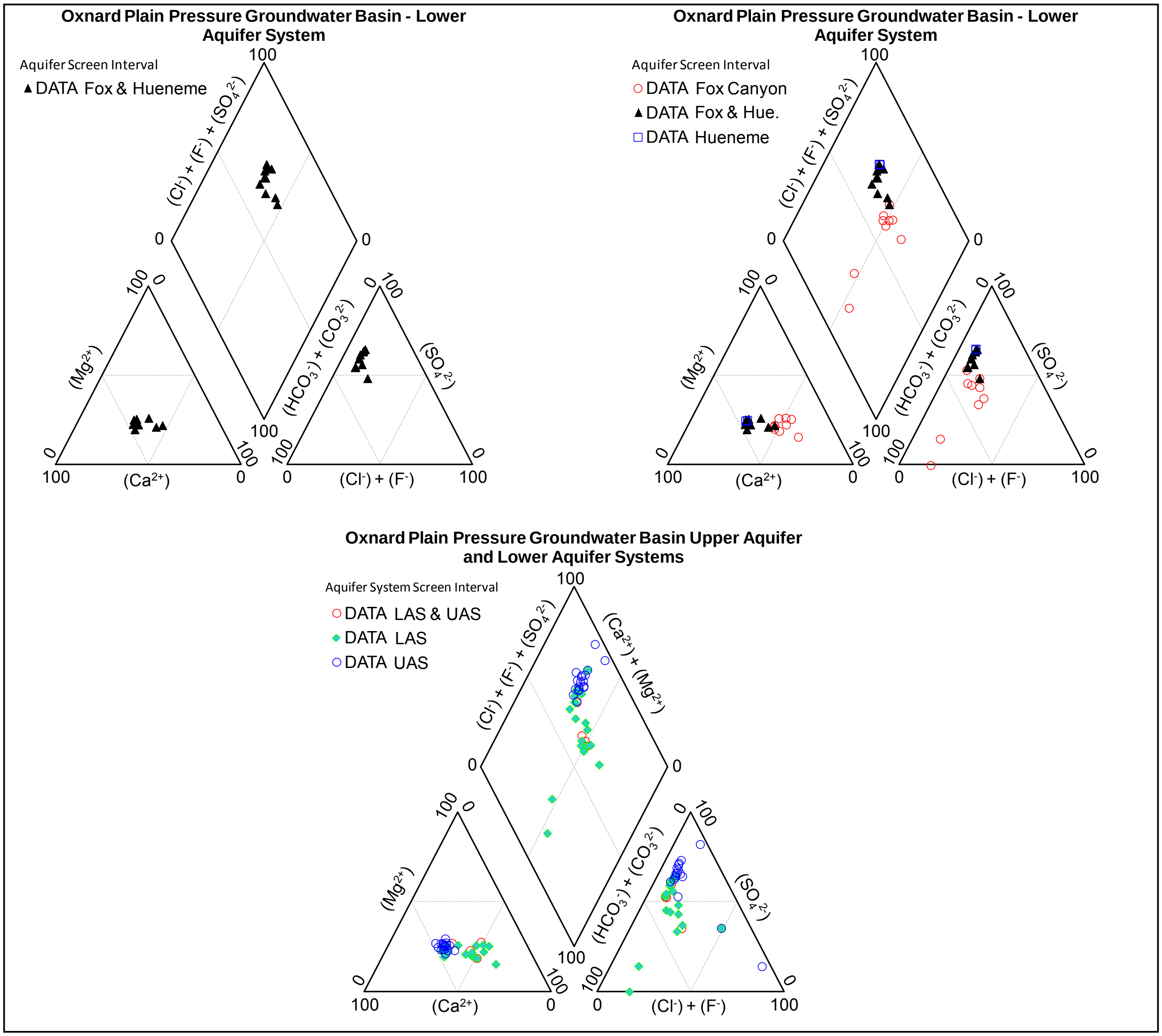
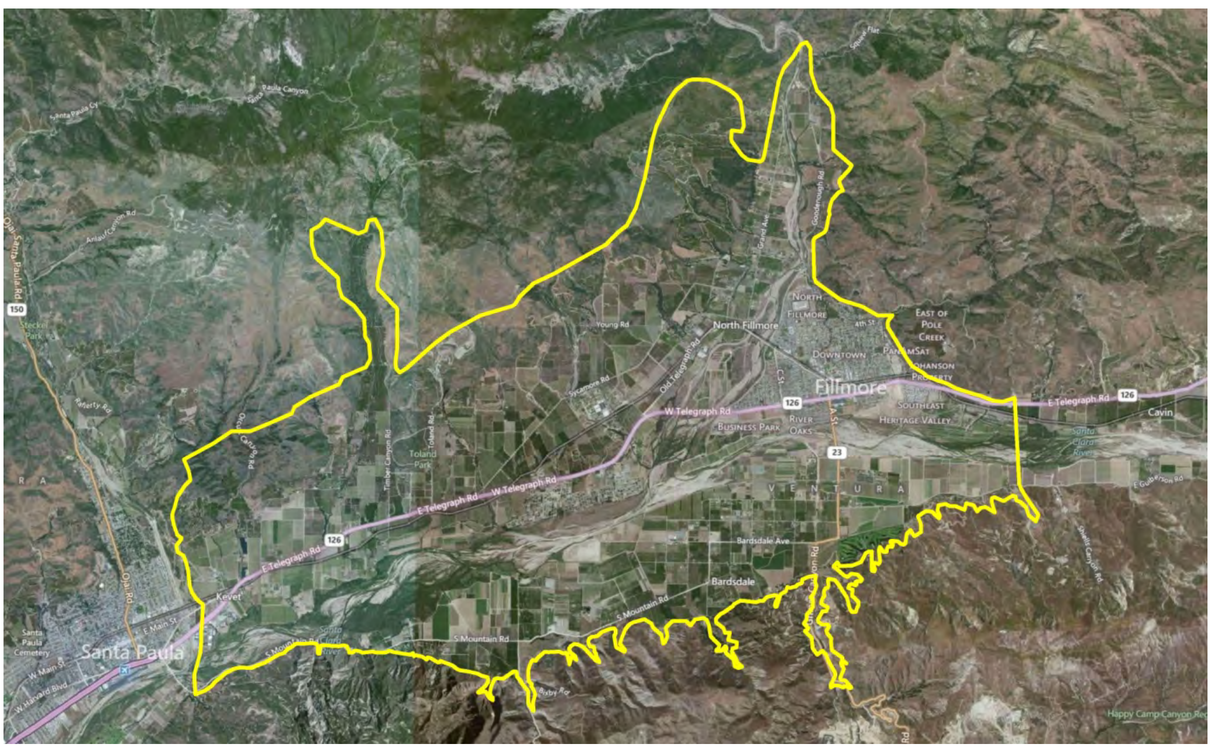


Figure 3-4 (cont.)

3.2.2 - Fillmore Basin

The Fillmore Basin, though small in geographic area, has a total aquifer thickness of almost 8,000 feet in some places. Despite the depth of the basin, County records indicate that water wells are generally no deeper than approximately 950 feet. Water quality can vary greatly depending on depth of the well. Shallow groundwater is generally younger and recharged by river flows with varying chemistry. Deeper groundwater is older and has acquired its chemistry through dissolution of constituents from the surrounding sediments. There are approximately 706 water supply wells in the Fillmore Basin; 450 are active. Historically, nitrate (NO_3^-) concentrations have been elevated because of extensive use of fertilizers and septic system discharges, but of the eleven wells sampled this year only three showed elevated NO_3^- concentration relative to the primary MCL for drinking water. Groundwater samples from all eleven wells are above the secondary MCL for drinking water for sulfate (SO_4^{2-}). Average TDS for the wells sampled this year is 1297 mg/l with one sample at 2430 mg/l, well above the secondary MCL for drinking water. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents are below the primary MCL for drinking water. Water quality tends to become poorer to the south east portion of the basin in the vicinity of the Oak Ridge fault. Figure 3-5 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Fillmore Basin.

Based on the piper diagram, water in the Fillmore basin tends to have calcium (Ca^+) as the major cation and sulfate (SO_4^{2-}) as the major anion. The second piper diagram compares water samples from the Piru and Santa Paula Basins with that from the Fillmore Basin. Samples from the Piru Basin have sulfate as the dominant anion but do not clearly have a dominant cation. There is more variation in the chemistry of water in the Piru basin than the other two. Water samples from the Santa Paula Basin tend to be more similar to that from the Fillmore Basin but only three wells were sampled so we may not have a true representation of the Santa Paula Basin chemistry.



Aerial photo showing the extent of the Fillmore groundwater basin.

FILLMORE BASIN

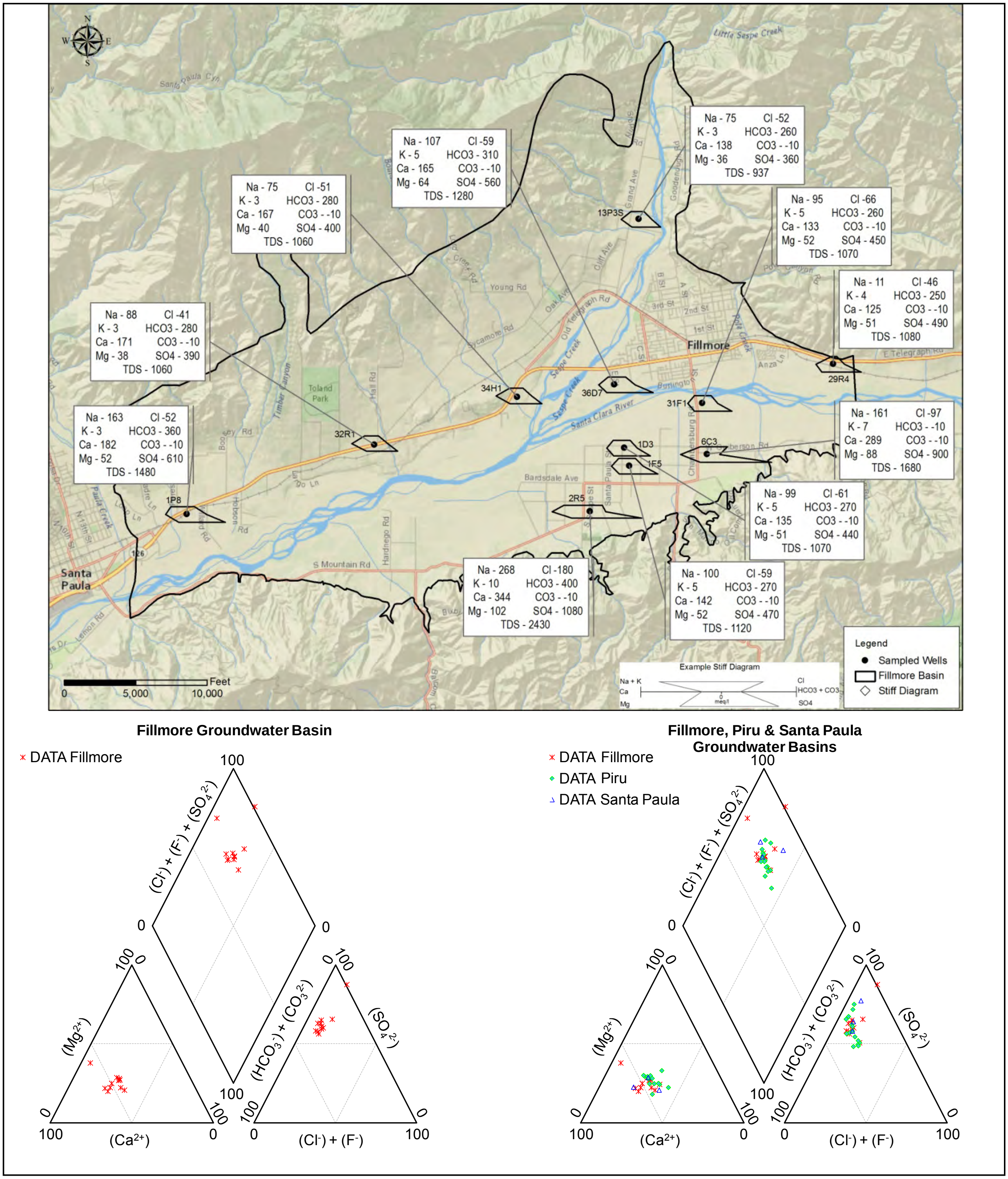


Figure 3-5: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.3 - Santa Paula Basin

The Santa Paula Basin is a court adjudicated groundwater basin. In an effort to prevent overdraft, a June 1991 judgment ordered the creation of the Santa Paula Basin Pumpers Association (SPBPA). The SPBPA regulates extractions in the Santa Paula Basin. The judgment stipulated an allotment of 27,000 acre-feet per year could be pumped from the basin. Water quality in the basin has not changed substantially since 2007. The depth to the water bearing material is 65 to 160 feet. There are approximately 373 water supply wells in the Santa Paula Basin; 176 are active. TDS concentrations for water in the three wells sampled vary from 890 to 2410 mg/l, with an average value of 1553 mg/l for wells sampled this season; all above the current secondary MCL for drinking water. Water samples from all the wells have concentrations above the secondary MCL for sulfate and manganese and one has concentrations above the secondary MCL for iron. A water sample from one agricultural well was analyzed for inorganic chemicals (Title 22 metals); it has a selenium concentration above the primary MCL for drinking water. The concentrations of all remaining inorganic chemicals were below the primary MCL. Figure 3-6 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium(Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Santa Paula Basin.

Aerial photo showing the extent of the Santa Paula groundwater basin.

SANTA PAULA BASIN

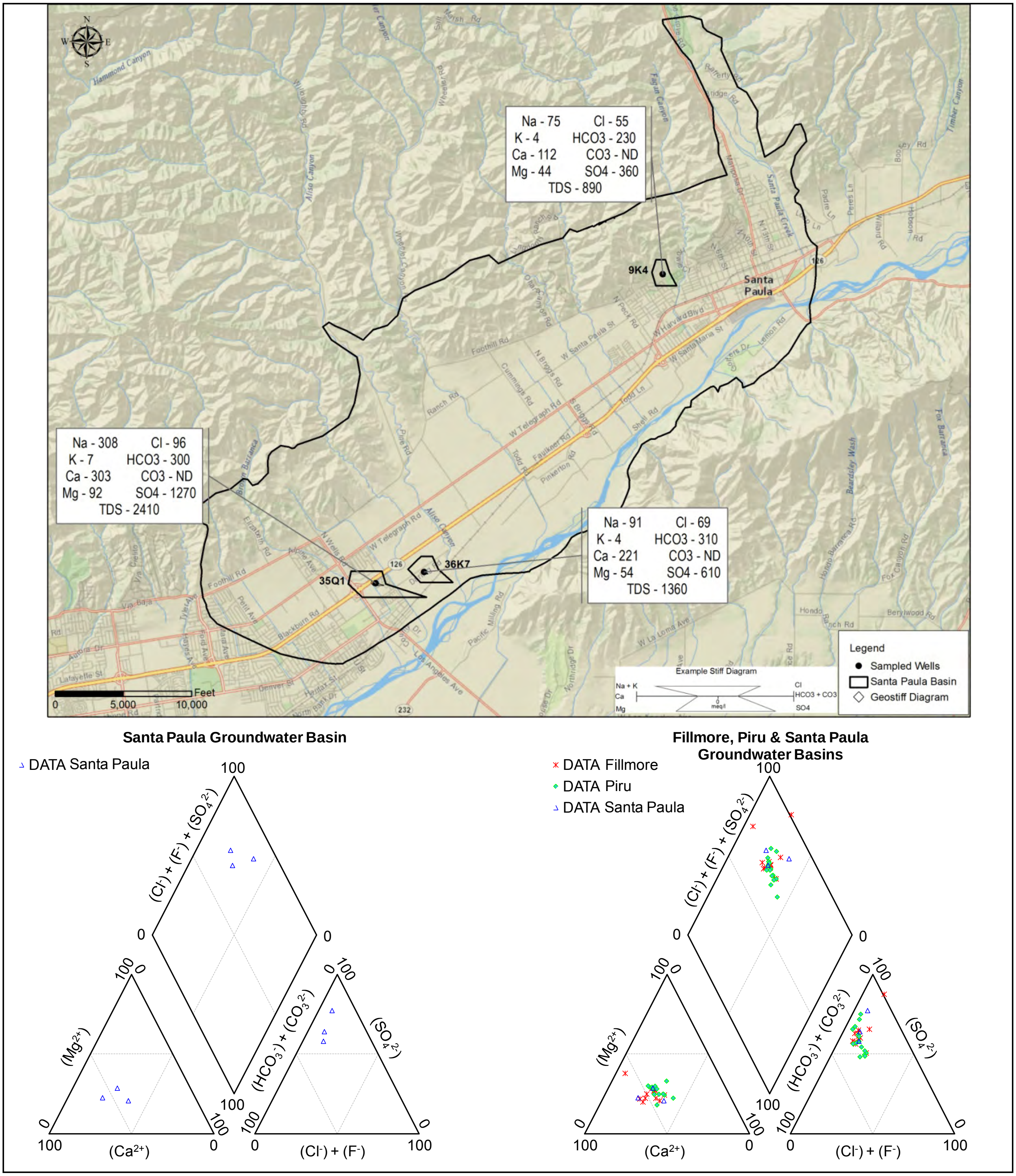


Figure 3-6: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

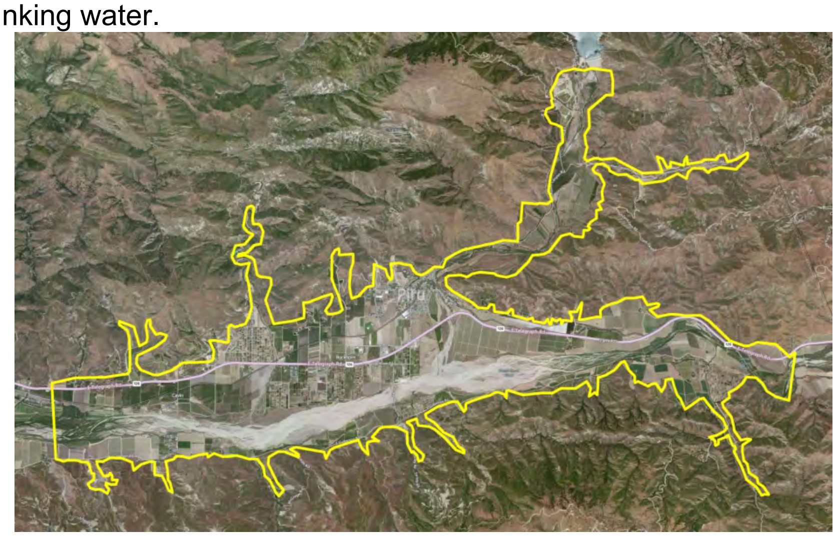
3.2.4 – Piru Basin

The Piru Basin groundwater recharge is principally from precipitation, releases of water by United Water Conservation District from Lake Piru, 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 236 water supply wells in the Piru Basin; 163 are active. Depth to the main water bearing material is approximately 30 to 90 feet. The Los Angeles Regional Water Quality Control Board (LARWQCB) has adopted a Basin Plan Amendment that includes a Total Maximum Daily Load (TMDL) of 117 mg/l for chloride (Cl^-) in surface water and 150 mg/l in groundwater for the stretch of the Santa Clara River in Ventura County east of Piru Creek.

Fourteen wells were sampled in the Piru Basin during this round of sampling. None of the groundwater sampled has a Cl^- concentration above the chloride TMDL. The average TDS concentration of the water sampled this season is 1420 mg/l with all wells above the secondary MCL for drinking water; three wells have concentrations significantly above 2000 mg/l. Water samples from thirteen wells have sulfate (SO_4^{-2}) concentrations greater than the secondary MCL for drinking water and five have manganese (Mn) concentrations greater than the secondary MCL. Samples from the Piru Basin have sulfate as the dominant anion; it has no dominant cation. The piper and stiff diagrams show significant variation in the chemistry of water in the Piru basin. Figure 3-7 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}).

Water samples from all fourteen wells were analyzed for inorganic chemicals (Title 22 metals). Three wells in the Piru Basin located south of Highway 126 have consistently been found to have selenium levels that exceed the primary MCL for drinking water of 0.05 mg/l (50 µg/l). One of the wells was sampled this year. It continues to have the highest concentrations of SO_4^{2-} and TDS of all wells sampled in the basin. Elevated selenium concentrations occur in those wells perforated in the interval between approximately 125 to 250 feet below ground surface. A well located north of Highway 126 and perforated at a similar elevation does not have high selenium. Further testing of groundwater, surface water and cuttings obtained from future drilling is planned by staff in order to determine a possible source. Owners of the wells have been notified by Ventura County Environmental Health Department about possible adverse health effects from ingestion of water containing selenium.

Radiochemistry analysis was completed on water from one of the wells. Gross alpha was below the primary MCL for drinking water.



Aerial photo showing the extent of the Piru groundwater basin.

PIRU BASIN

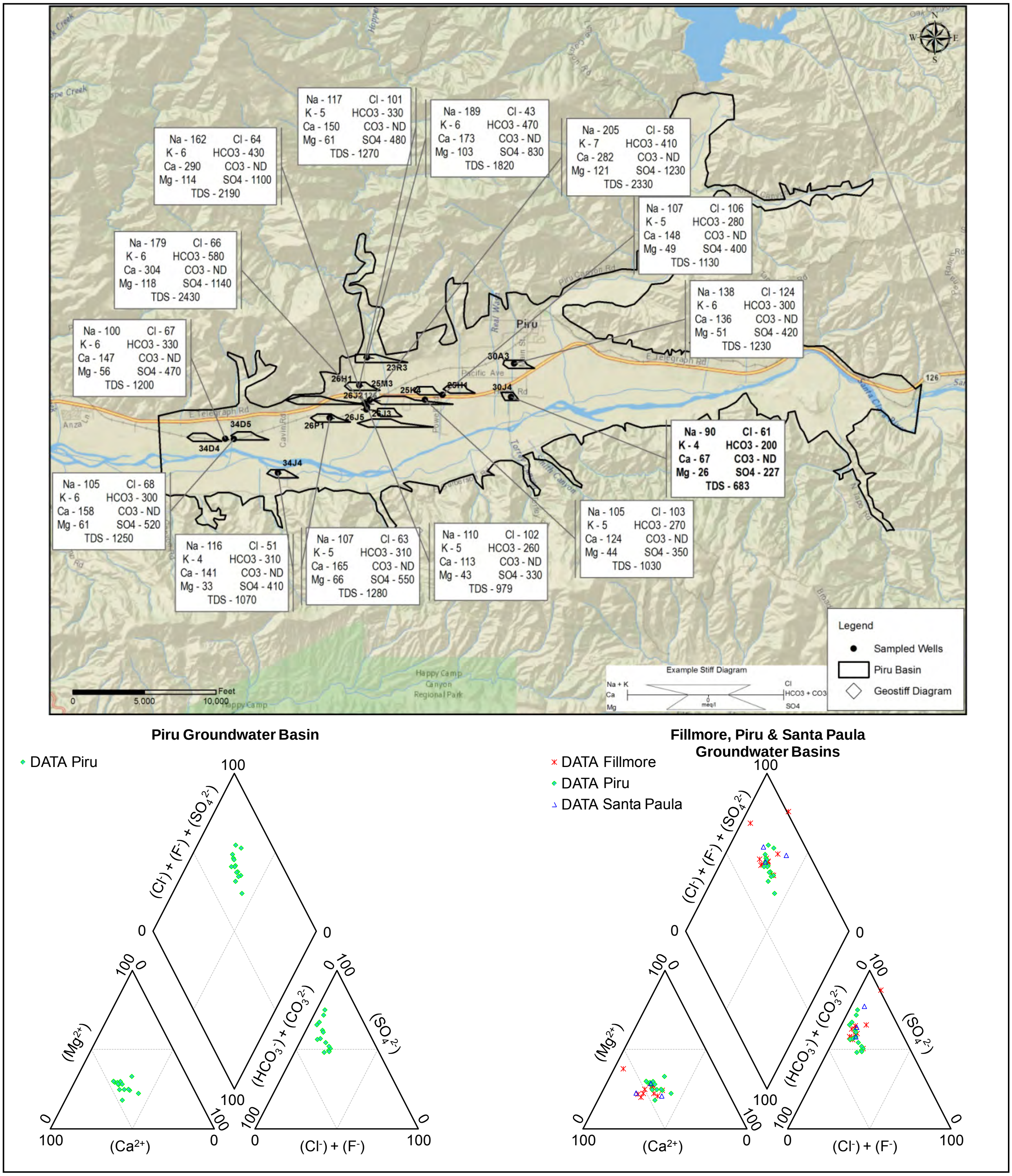
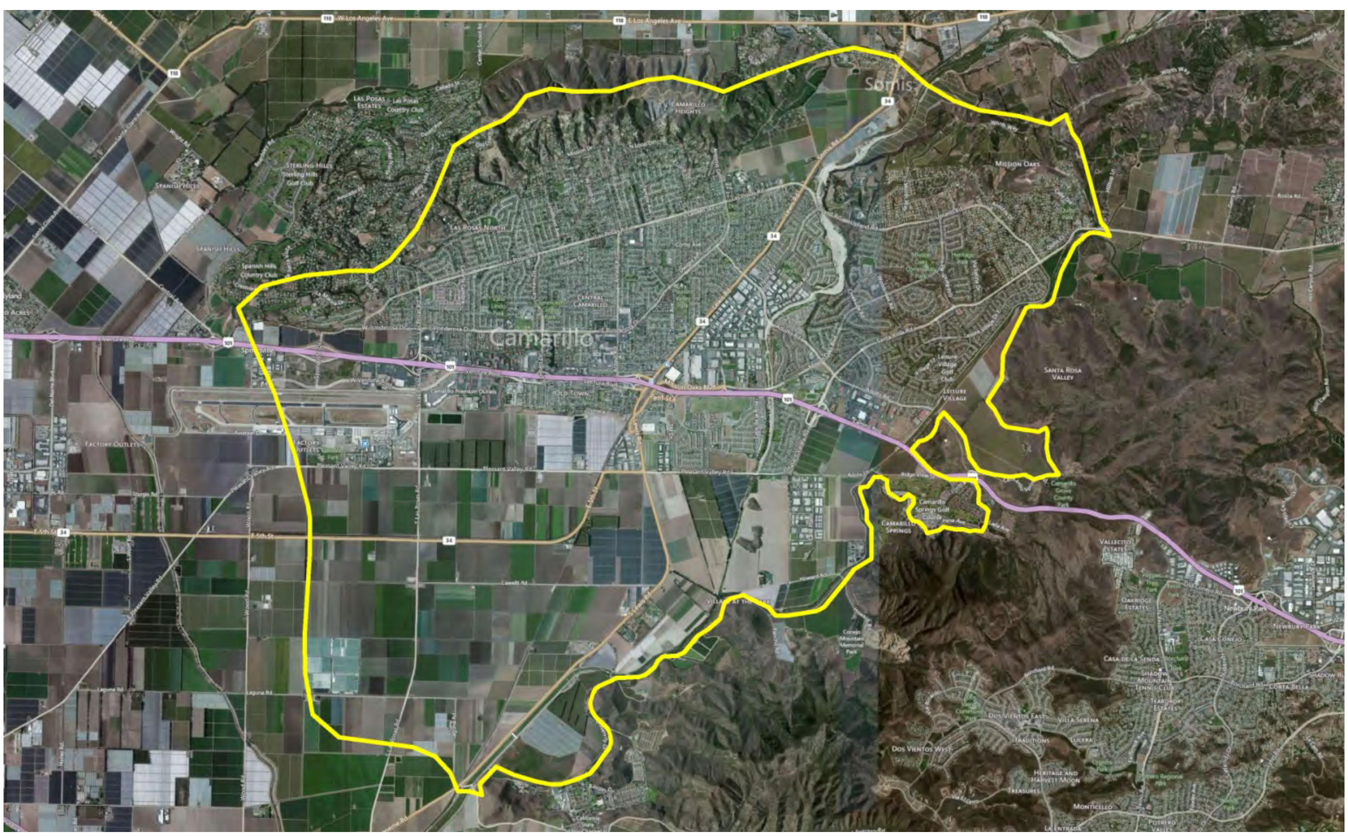


Figure 3-7: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.5 - Pleasant Valley Basin

In the Pleasant Valley Basin groundwater quality can vary greatly throughout the basin. Depth to the main water bearing unit is approximately 400 to 500 feet. The shallower groundwater bearing unit at 35 to 60 feet it is not used because the water quality is very poor. There are approximately 476 water supply wells in the Pleasant Valley Basin; 86 are active. Thirteen wells were sampled during this round of sampling. TDS concentrations vary from 844 to 4770 mg/l with an average of 1527 mg/l. Sulfate (SO_4^{2-}) ranges from 44 to 2350 mg/l with eleven of the wells having concentrations above the secondary MCL for drinking water with an average of 550 mg/l. Ten water samples have iron (Fe) concentrations above the secondary MCL for drinking water and five have manganese (Mn) concentrations above the secondary MCL. Chloride (Cl^-) concentrations are above 117 mg/l in water samples from all except two wells with an average value of 222 mg/l. Samples from three wells have Cl^- concentrations above the secondary MCL for drinking water, but the LARWQCB Basin Plan indicates that agricultural beneficial uses are impaired when the concentration is above 117 mg/l. Piper and stiff diagrams show there is quite a bit of variation in water chemistry for Pleasant Valley Basin. The chemistry of wells perforated only in the lower zone and those perforated in both the upper and lower zone is similar. Only one well that was sampled was perforated solely in the shallow zone and it has the poorest water quality; the highest sulfate, chloride and TDS concentrations. The piper diagram that compares the Pleasant Valley lower zone with the Oxnard Plain Pressure LAS shows the chemistry is somewhat similar, but both systems have considerable water quality variation. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the primary MCL for drinking water. Figure 3-8 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}).



Aerial photo showing the extent of the Pleasant Valley groundwater basin.

PLEASANT VALLEY BASIN

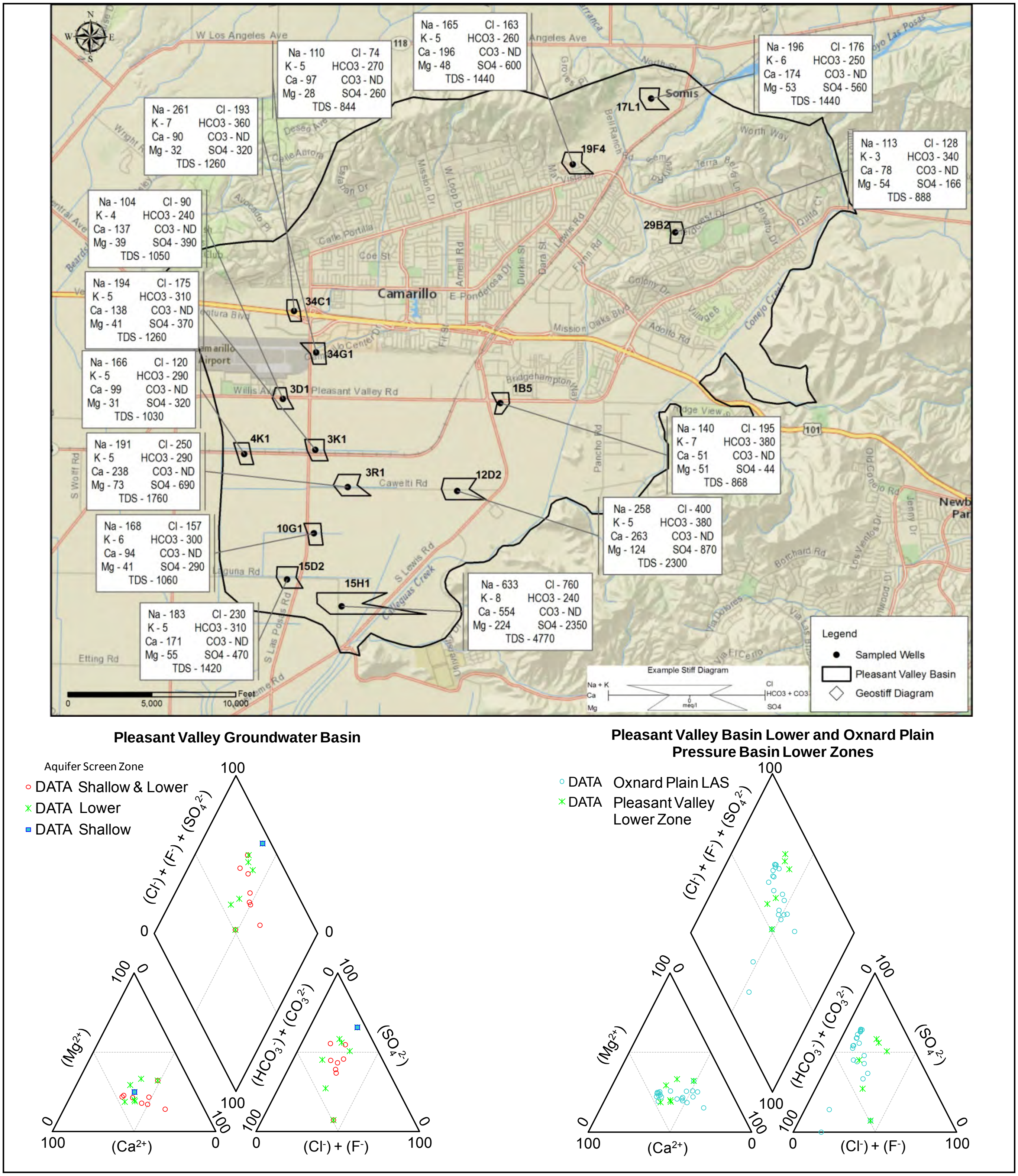
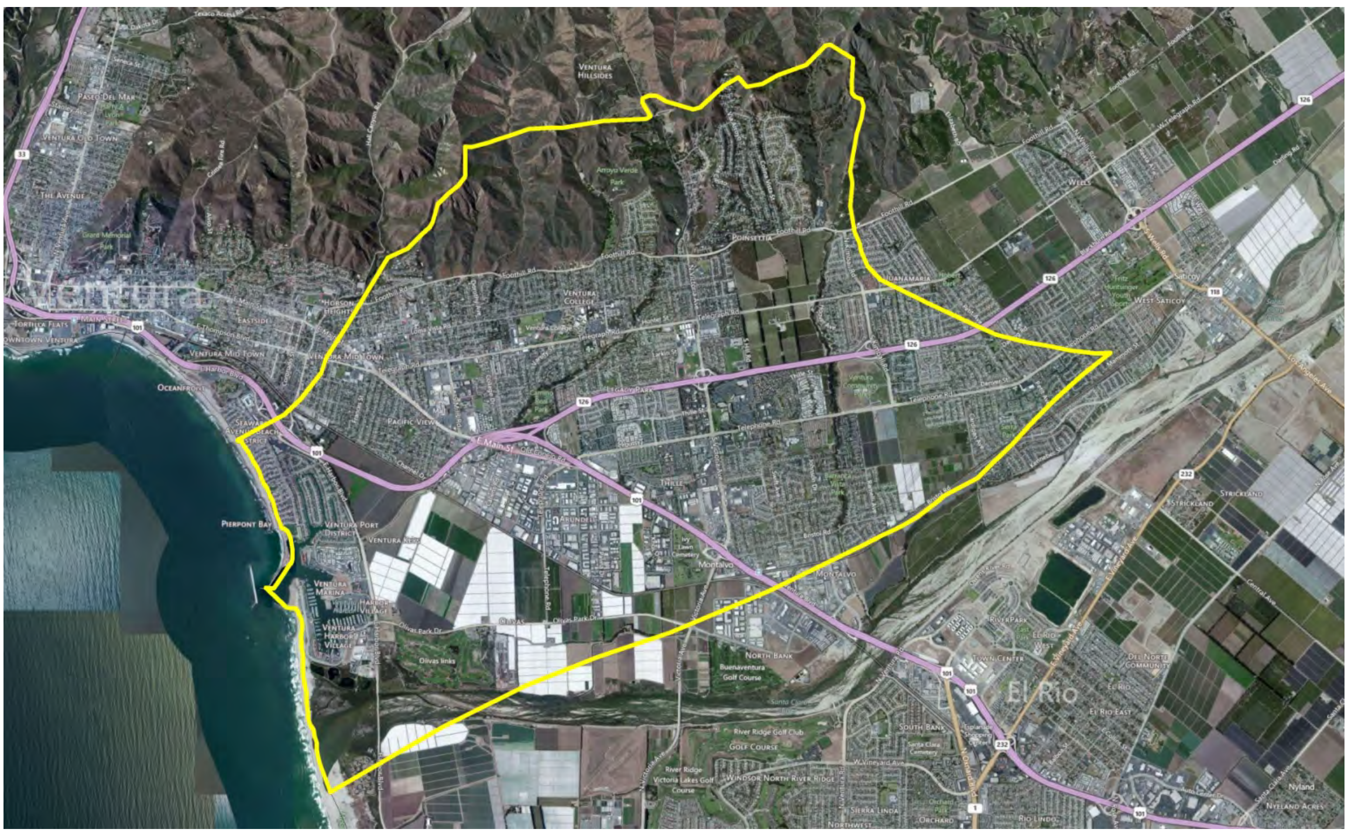


Figure 3-8: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.6 - Mound Basin

The Mound Basin water bearing units consist of Quaternary alluvium and the San Pedro Formation. The alluvium consists of silts and clays with lenses of sand and gravel and reaches a maximum thickness of about 500 feet. The San Pedro Formation consists dominantly of fine sands and gravels and extends as deep as 4,000 feet. Groundwater is generally unconfined in the alluvium and confined in the San Pedro Formation. Based on the data collected this year and historic water quality data for the basin, water quality is generally better in the lower zone. There are approximately 143 water supply wells in the Mound Basin; 51 are active. The average TDS concentration for the three wells sampled this year is 1997 mg/l; all above the secondary MCL for drinking water. Sulfate and manganese are greater than the secondary MCL for drinking water in all three wells sampled and iron is above the secondary MCL in two wells. A water sample from one well was analyzed for inorganic chemicals (Title 22 metals). All inorganic constituents were below the primary MCL for drinking water. Water quality in the Mound Basin is similar to that in the Santa Paula Basin, but the three wells sampled may not be representative of the whole basin. Figure 3-9 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}).



Aerial photo showing the extent of the Mound groundwater basin.

MOUND BASIN

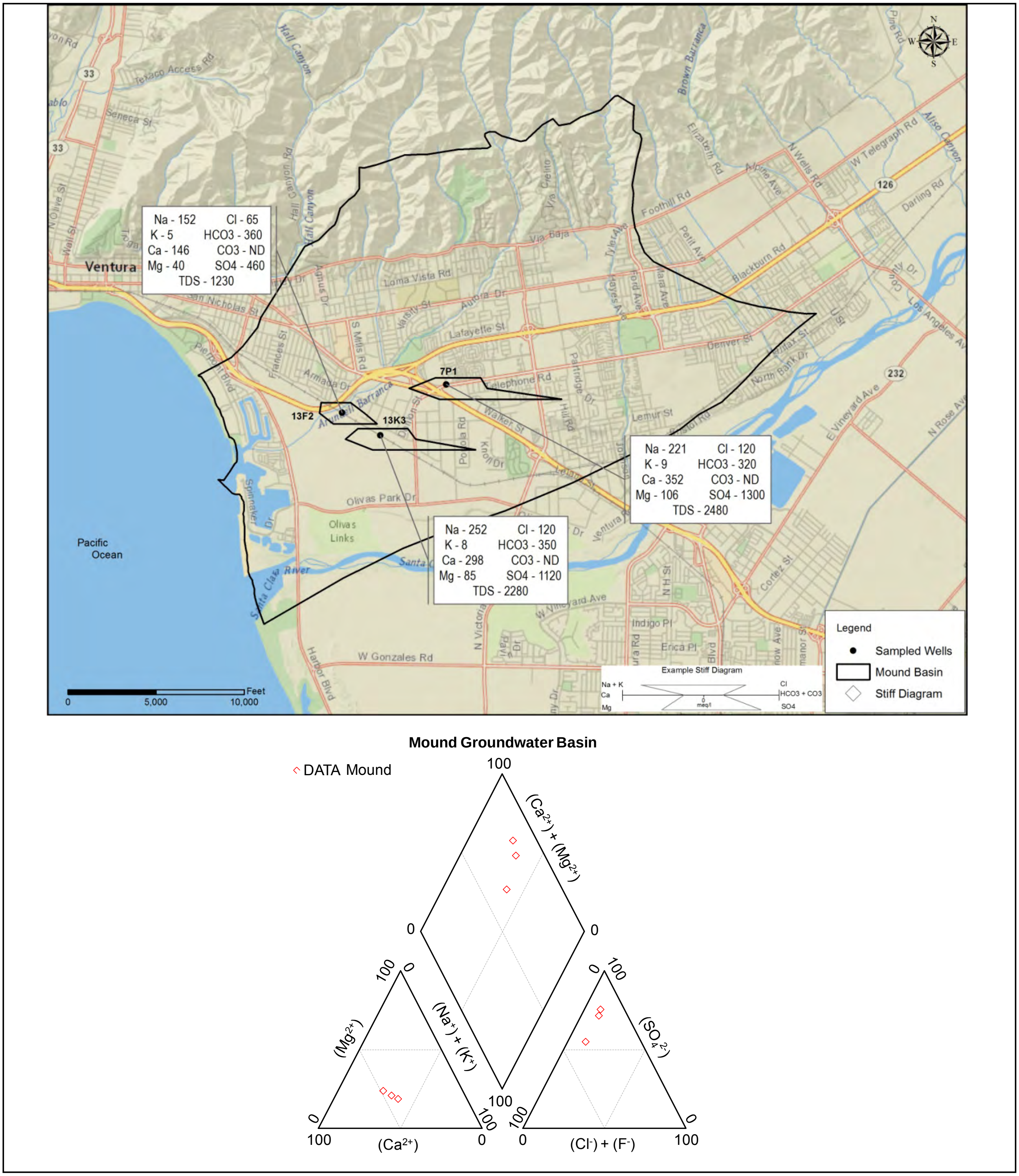
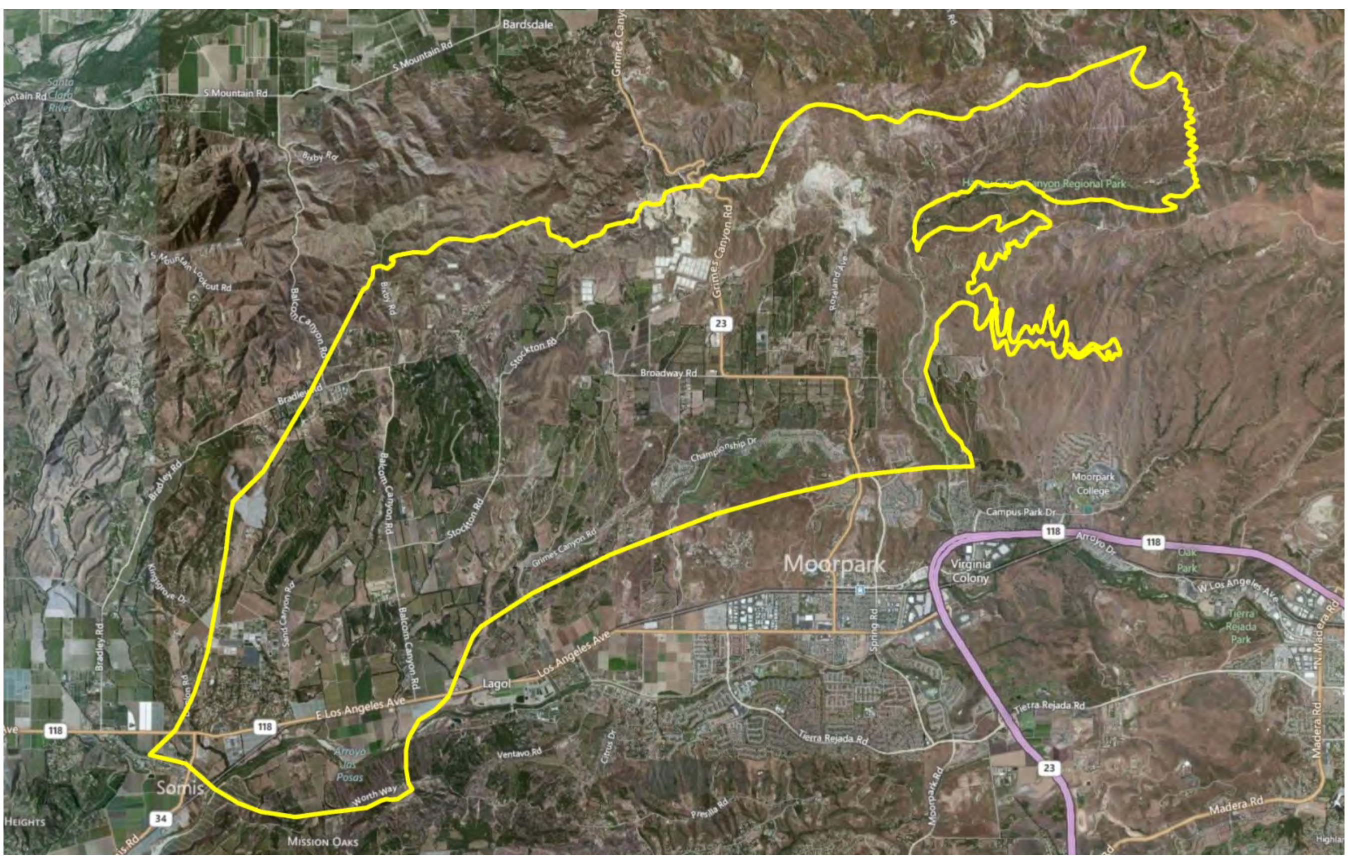


Figure 3-9: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.7 - East Las Posas Basin

The East Las Posas Basin contains part of the Fox Canyon Aquifer which is generally considered to be confined in the East Las Posas Basin. However data indicates the Fox Canyon Aquifer receives recharge from leakage from aquifers located above it (FCGMA 2007 Basin Management Plan). The exact hydrogeologic connectivity is not well understood. There are approximately 294 water supply wells in the East Las Posas Basin; 155 are active. Of the seven wells sampled in the East Las Posas Basin, the three wells located in the southwest portion of the basin near the Arroyo Las Posas, have very different water chemistry. Based on the stiff diagram, the dominant cations in the southwestern wells are sodium and calcium and the dominant anion is sulfate. TDS, sulfate and manganese are above the secondary MCL for drinking water in all three southwestern wells. The remainder of the wells have good water quality with an average TDS of 486 mg/l. The dominant cations in remaining wells are also sodium and calcium, and bicarbonate is the dominant anion. Water from two wells was analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the primary MCL for drinking water. The right-hand piper diagram (Figure 3-10) shows a comparison of East, West, and South Las Posas water chemistry. Based on the sharp change in water level between the East Las Posas and West Las Posas basins, the degree of hydrologic connection appears to be somewhat limited. Depth to the upper water bearing unit is approximately 120 to 150 feet and to the lower unit is approximately 530 to 580 feet. Figure 3-10 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}).



Aerial photo showing the extent of the East Las Posas groundwater basin.

EAST LAS POSAS BASIN

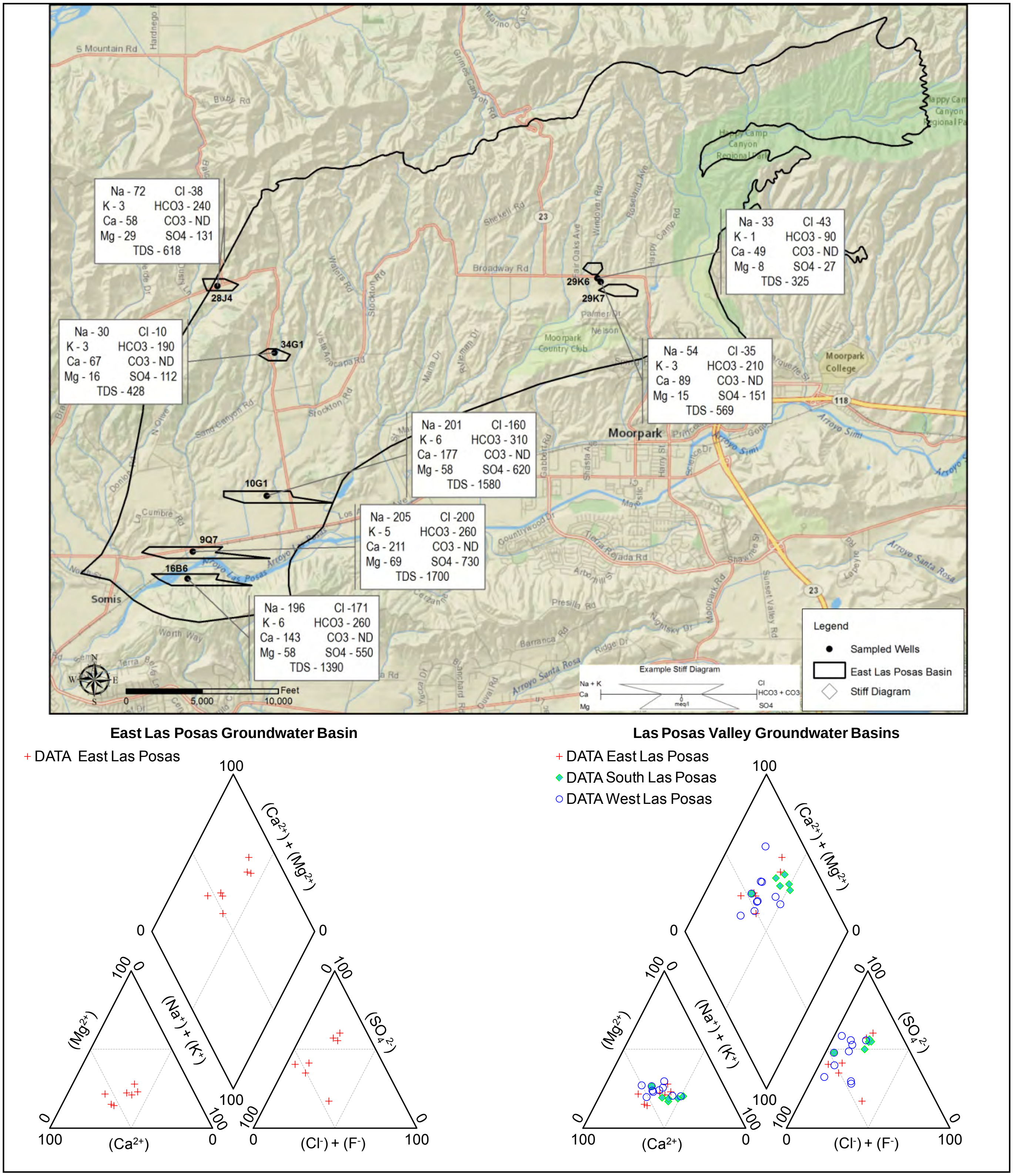
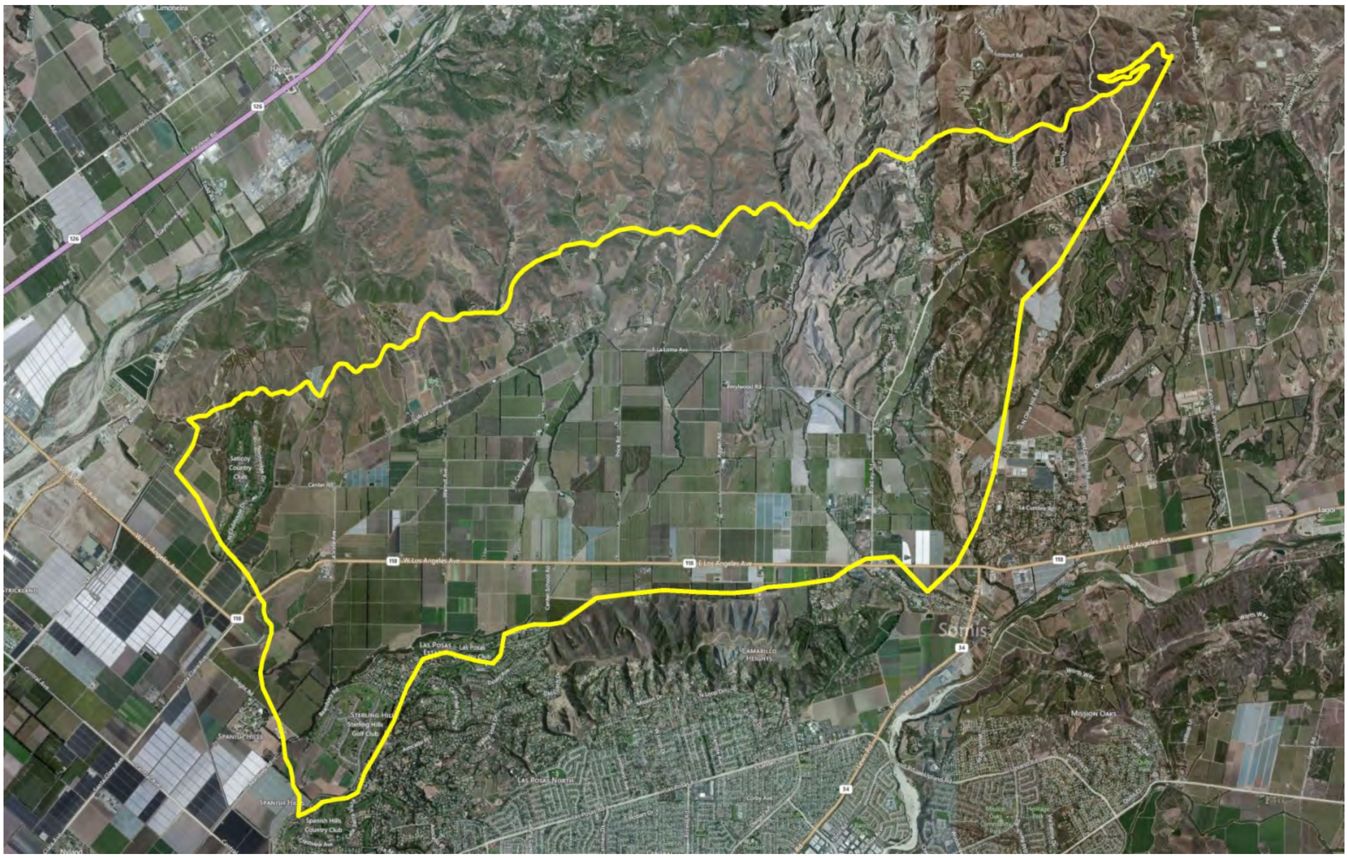


Figure 3-10: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

3.2.8 - West Las Posas Basin

All 10 wells sampled in the West Las Posas Basin this year have TDS above the secondary MCL for drinking water with an average of 861 mg/L. Two wells have nitrate concentrations above the primary MCL for drinking water. Four wells have sulfate (SO_4^{2-}) above the secondary MCL. Piper and stiff diagrams (Figure 3-11) show the variation in the chemistry of the West Las Posas Basin. There are approximately 158 water supply wells in the West Las Posas Basin; 64 of those are active. Figure 3-11 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the West Las Posas Basin.



Aerial photo showing the extent of the West Las Posas groundwater basin.

WEST LAS POSAS BASIN

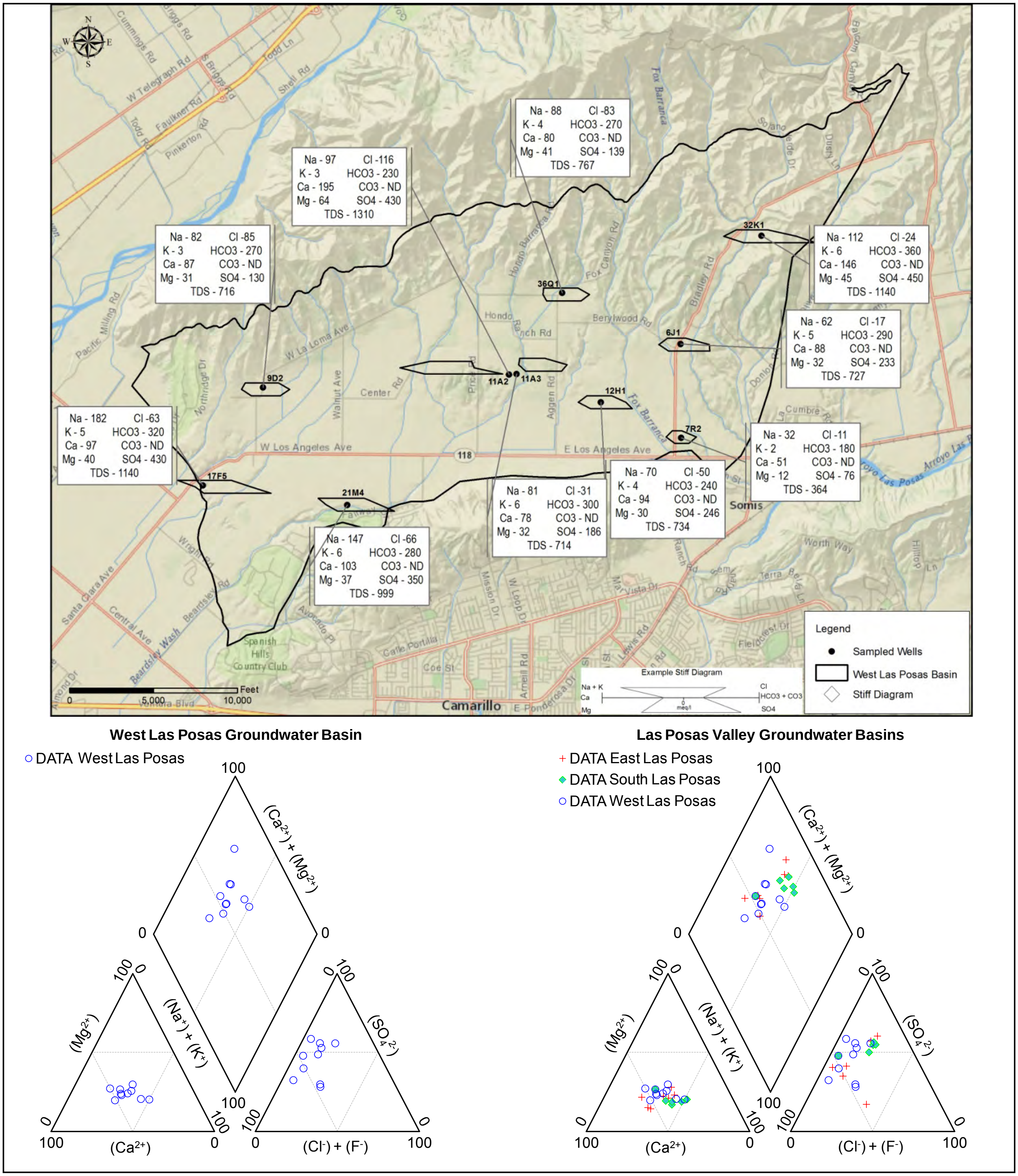
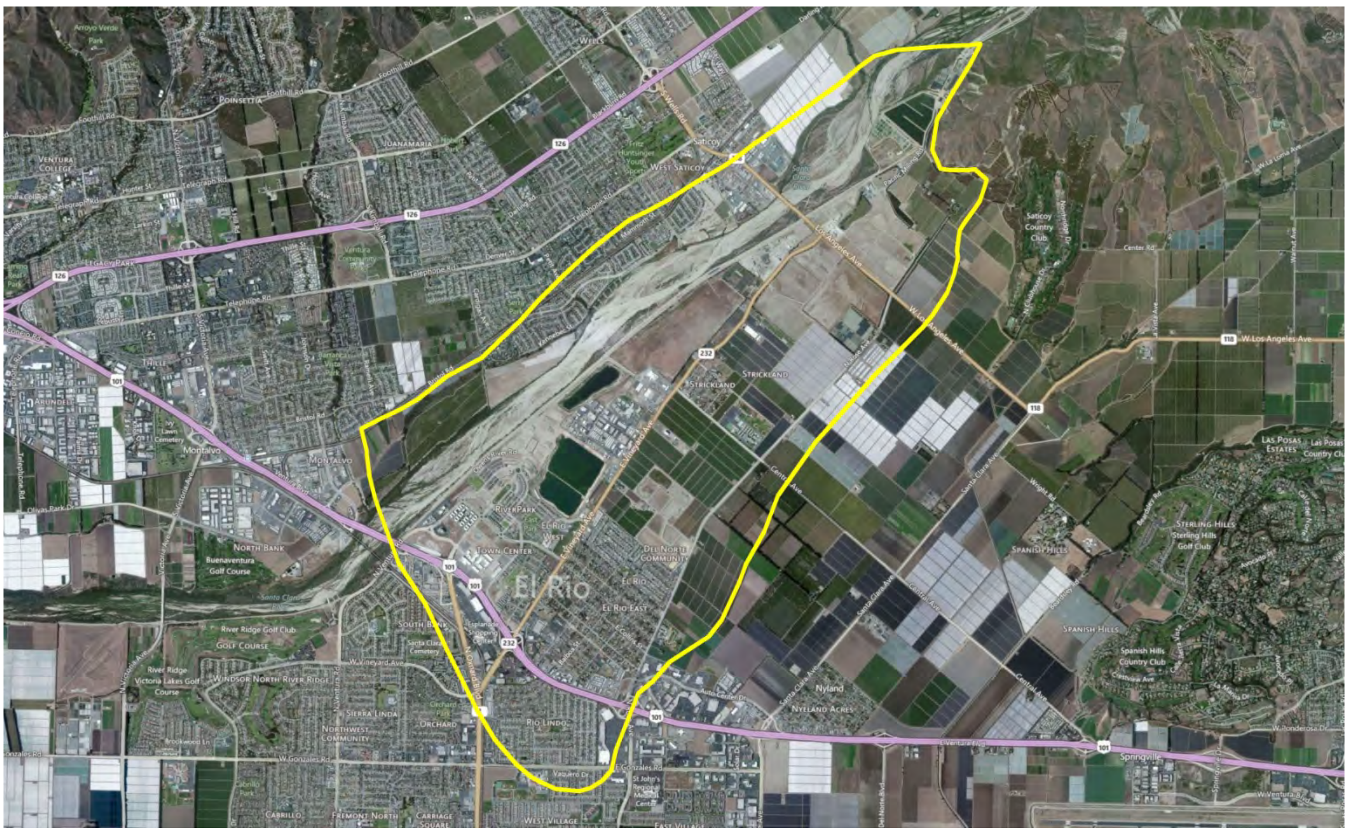


Figure 3-11: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.9 – Oxnard Plain Forebay Basin

The Oxnard Plain Forebay Basin is the principal recharge area for the Upper and Lower Aquifer Systems of the Oxnard Plain Pressure Basin. Approximate depth to the water bearing unit is 25 to 50 feet. There are approximately 364 water supply wells in the Oxnard Plain Forebay Basin; 139 are active. The Oxnard Plain Forebay generally has acceptable water quality except for the southern portion where high nitrate concentrations are common. The area to the north is predominantly agricultural with a few residential areas that still rely on individual septic systems. One well was sampled this season. It has TDS and sulfate concentrations above the secondary MCL for drinking water. The piper diagram (bottom of Figure 3-12) show that the one well sampled is similar in chemistry to that of the UAS of the Oxnard Plain Pressure Basin. Figure 3-12 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Oxnard Forebay Basin.



Aerial photo showing the extent of the Oxnard Plain Forebay groundwater basin.

OXNARD FOREBAY BASIN

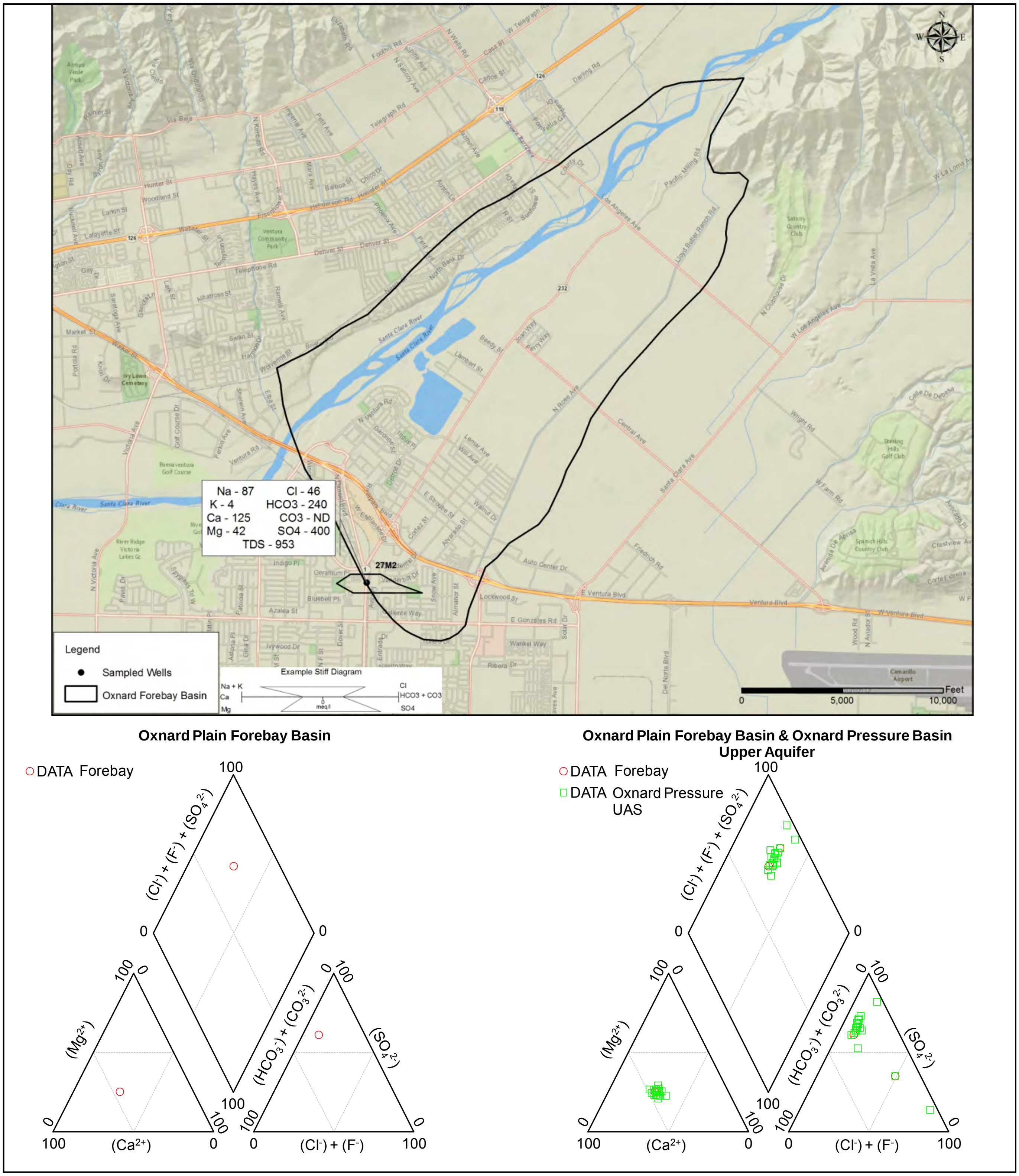
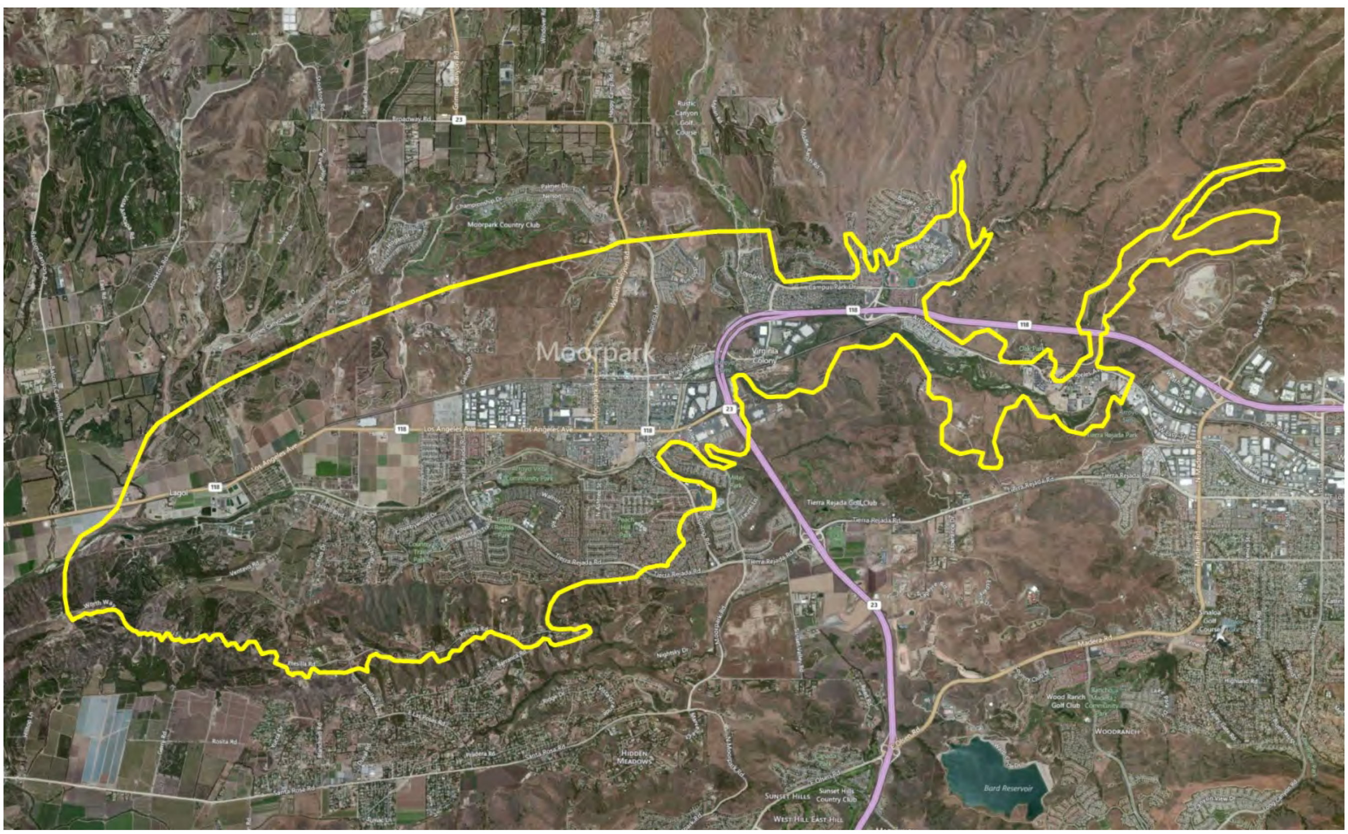


Figure 3-12: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.10 - South Las Posas Basin

The South Las Posas Basin has had no significant change in water quality over the past year. There are approximately 139 water supply wells in the South Las Posas Basin; 27 are active. The upper water bearing unit is approximately 25 to 50 feet below ground surface and the lower is at approximately 350 to 500 feet below ground surface. Generally, deeper wells perforated in the Fox Canyon aquifer tend to have better water quality, but that difference is not shown in these samples. Well 07B02 is perforated much deeper than the other two wells sampled but the chemistry is similar. Water from all five wells sampled has TDS and SO_4^{2-} concentrations above the secondary MCL for drinking water and slightly elevated chloride; not above the secondary MCL for drinking water (but high enough to be detrimental for some agricultural uses). A water sample from one well was analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the primary MCL for drinking water. Water chemistry in the South Las Posas Basin is fairly consistent across the basin. A comparison of the East, West, and South Las Posas Basins is shown in the piper diagrams at the bottom of Figure 3-13. The water chemistry in the South Las Posas Basin is similar to the chemistry in the southwest part of the East Las Posas Basin (Fig 3-10). Figure 3-13 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the South Las Posas Basin.



Aerial photo showing the extent of the South Las Posas groundwater basin.

SOUTH LAS POSAS BASIN

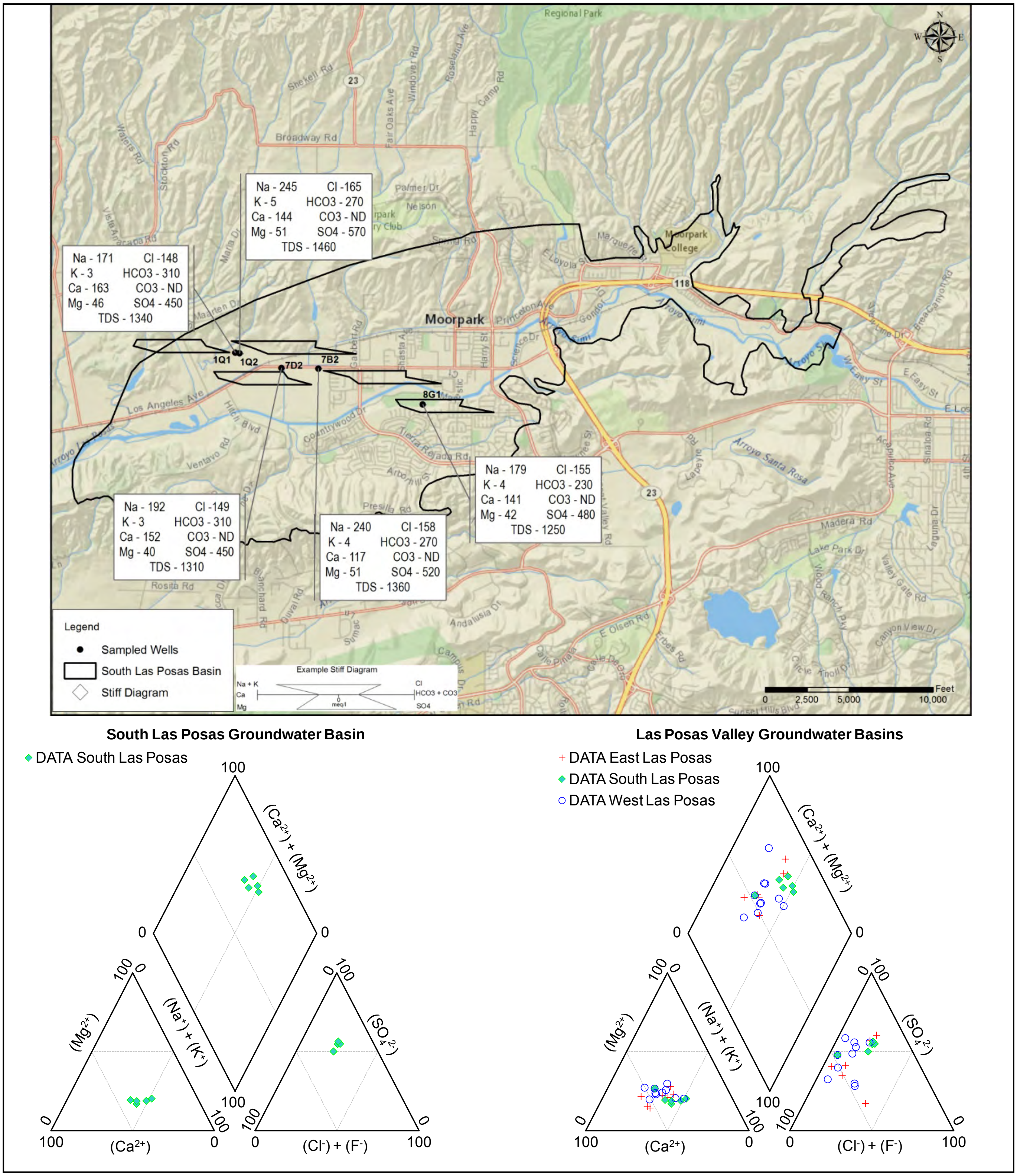
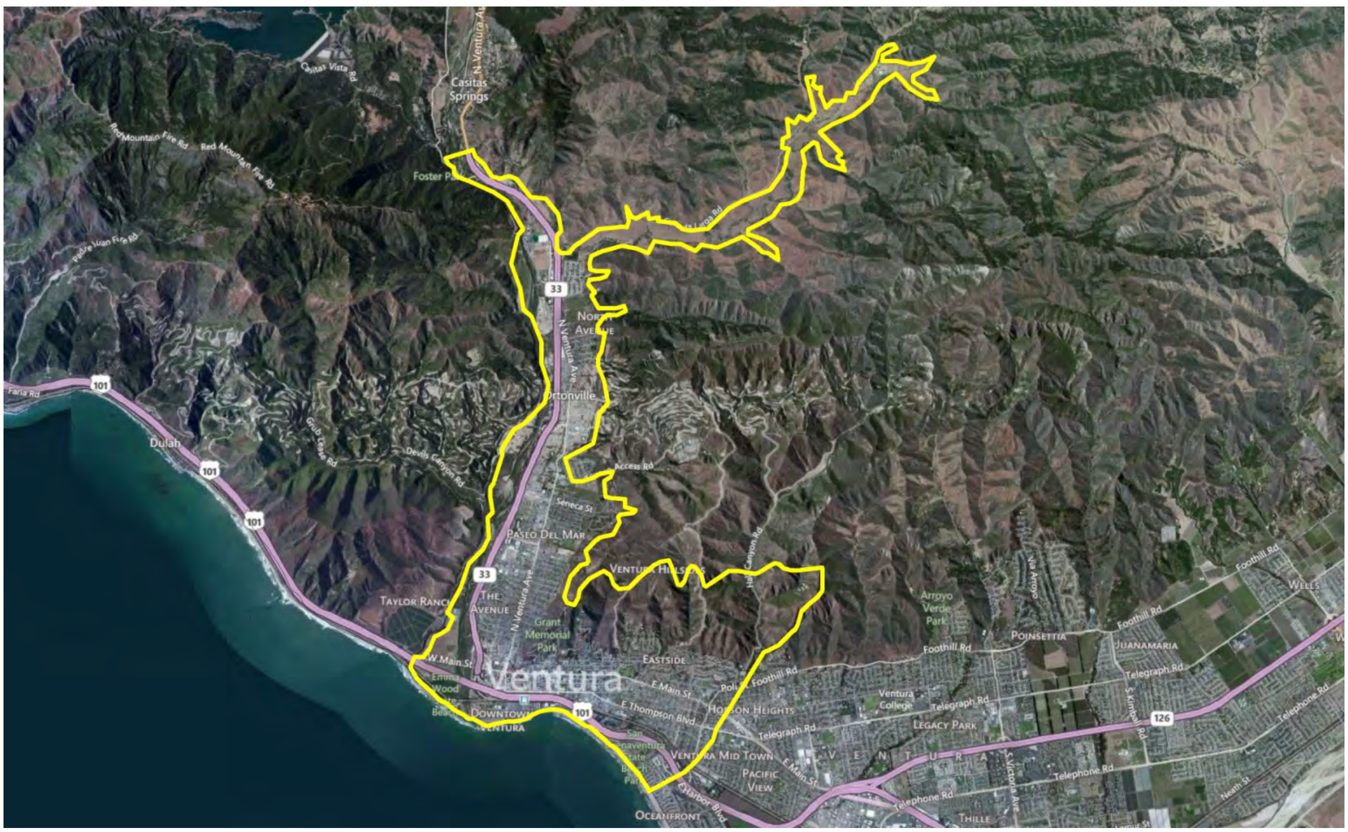


Figure 3-13: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.11 - Lower Ventura River Basin

The Lower Ventura River Basin has few remaining active water wells available for sampling. Depth to the water bearing unit is 3 to 13 feet below ground surface in the floodplain and deeper as the ground surface elevation increases towards the edge of the basin. There are approximately 61 water supply wells in the Lower Ventura River Basin; 11 are active. The two wells sampled this year are located in river alluvium near the coast. Total dissolved solids, sulfate, and manganese concentrations are above the secondary MCL, otherwise, both have relatively good water quality. Piper diagrams at the bottom of Figure 3-14 show a comparison of the chemistry between Upper and Lower Ventura River Basins. Figure 3-14 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Lower Ventura River basin.



Aerial photo showing the extent of the Lower Ventura River groundwater basin.

LOWER VENTURA RIVER BASIN

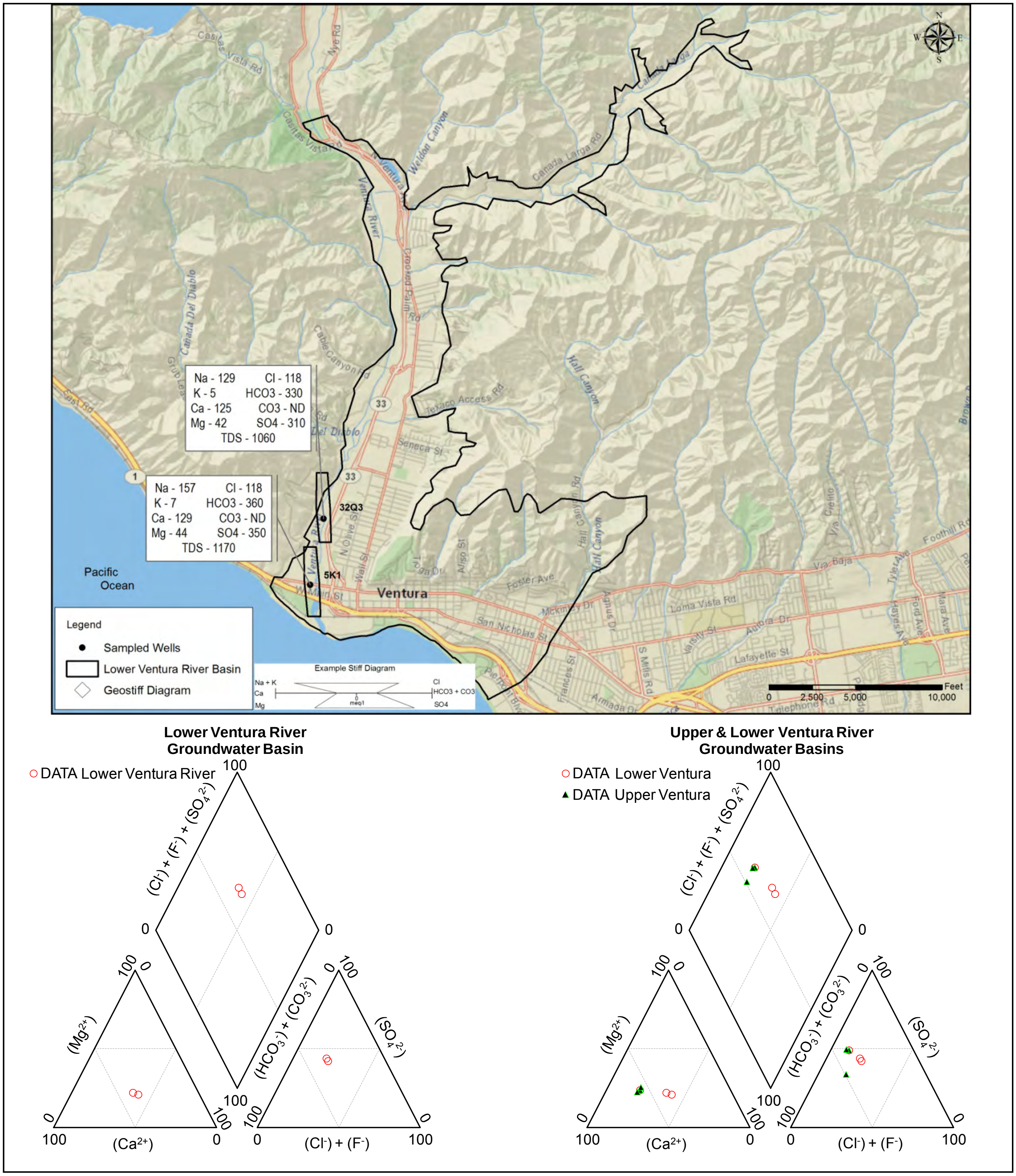
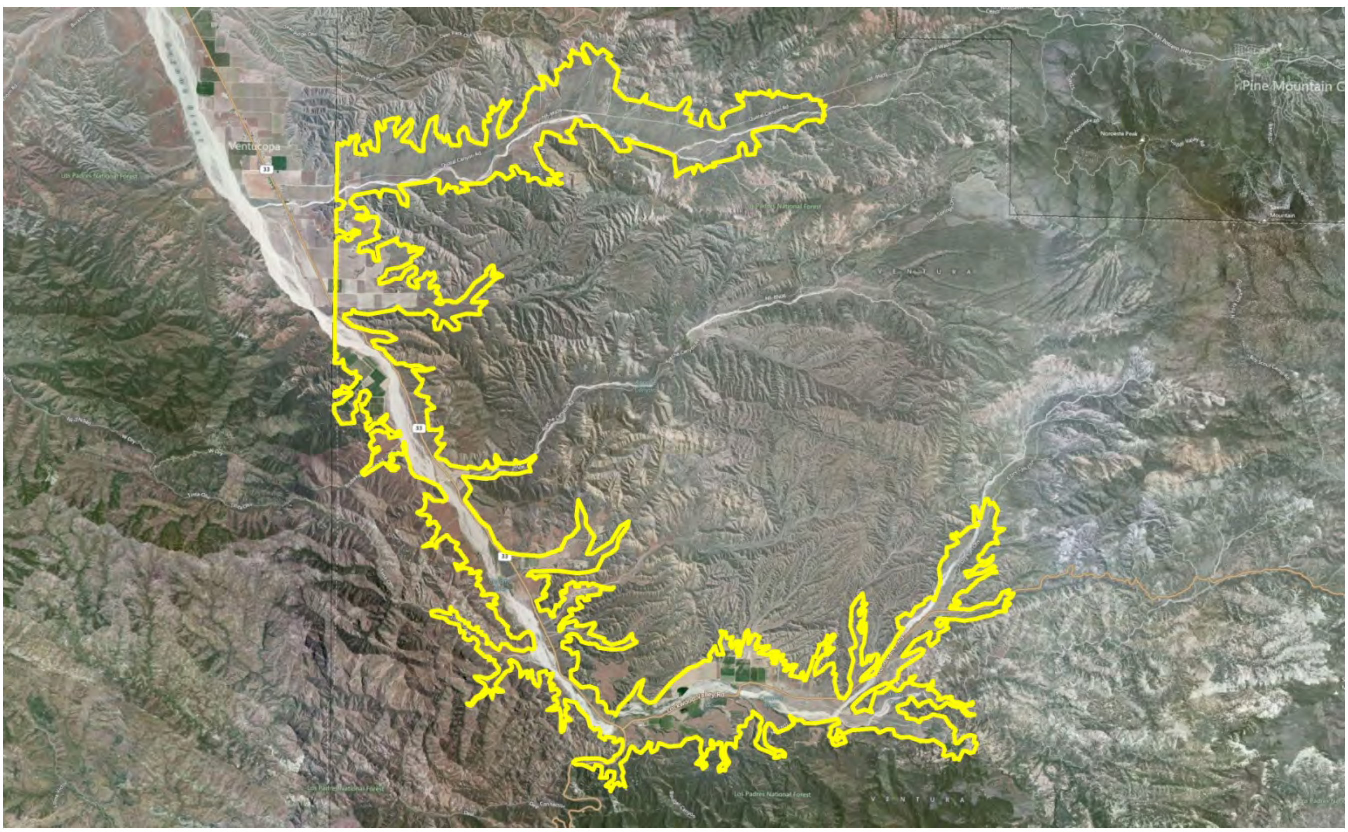


Figure 3-14: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.12 - Cuyama Valley Basin

The Cuyama Valley Basin is in a remote area in northwestern Ventura County. The aerial photo and the map in Figure 3-15 show only the portion of the basin that is in Ventura County. There are approximately 135 water supply wells in the Cuyama Valley Basin; 103 are active. All four wells sampled this year have TDS above the secondary MCL for drinking water; two have elevated iron (Fe); and one has elevated sulfate (SO_4^{2-}). Water samples from the four wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic constituent was above the primary MCL for drinking water. The Piper and Stiff diagrams at the bottom of Figure 3-15 show the water quality in the north part of the basin is very different from that in the south but there are not enough samples to evaluate localized conditions. California Department of Water Resources Groundwater Bulletin No. 118 indicates groundwater quality has been deteriorating in some areas because of cycling and evaporation of irrigation water. Depth to the main water bearing unit varies between 40 to 170 feet below ground surface. Figure 3-15 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Cuyama Valley basin.



Aerial photo showing the extent of the Cuyama Valley groundwater basin.

CUYAMA VALLEY BASIN

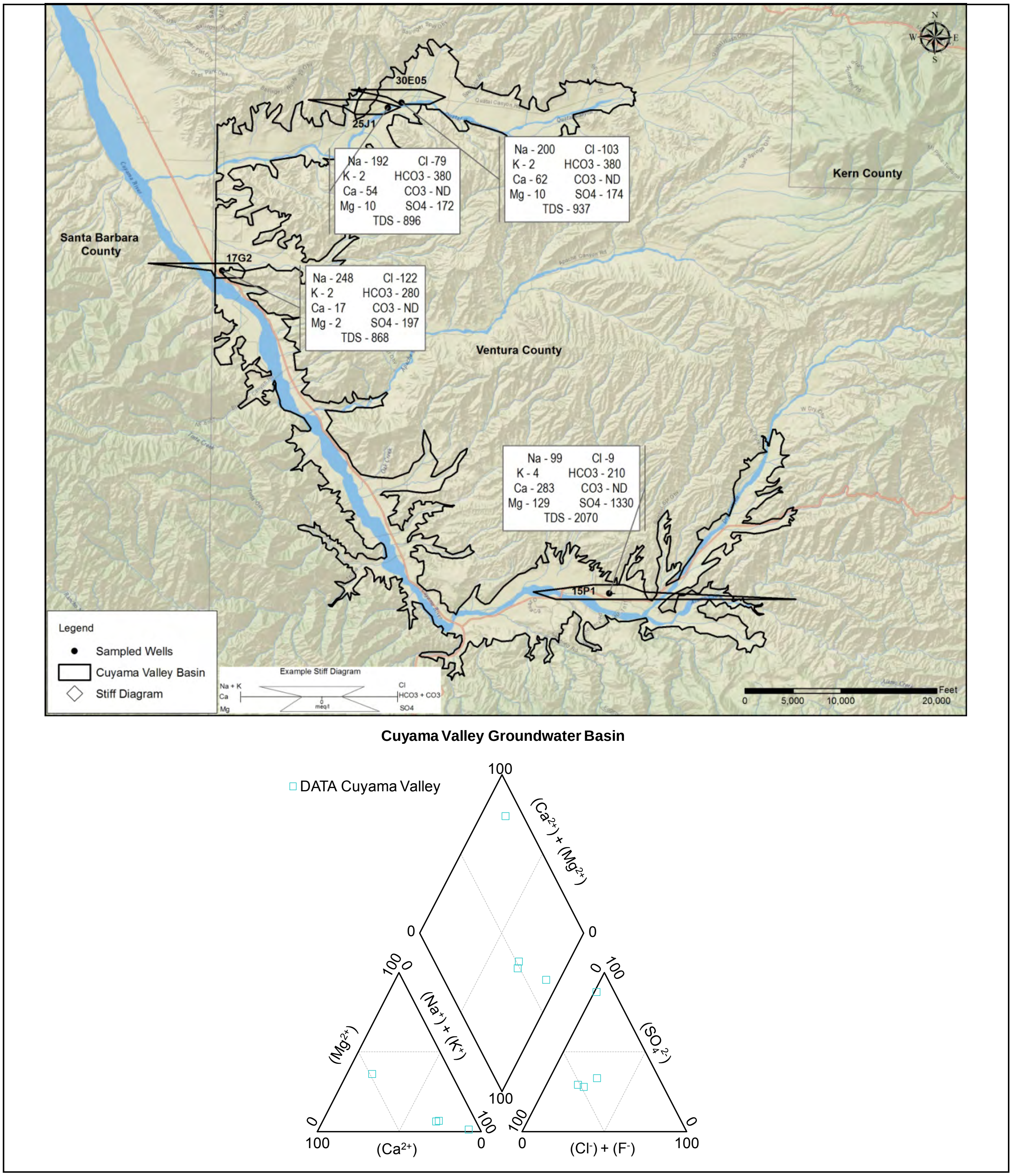
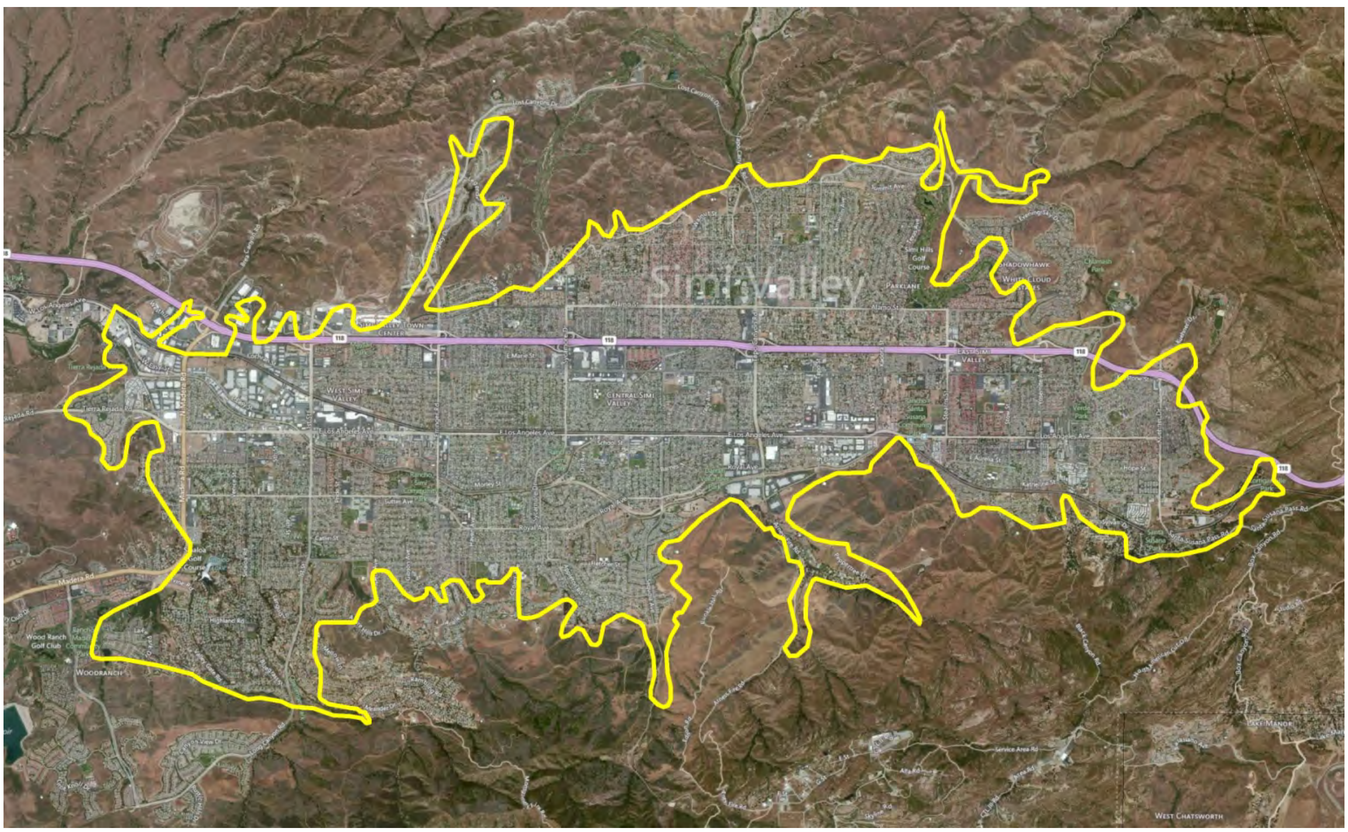


Figure 3-15: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.13 - Simi Valley Basin

The Simi Valley Basin drains to the west and, historically, water quality becomes more enriched in salts farther west in the basin. There are approximately 595 water supply wells in the Simi Valley Basin; 57 are active. Depth to water bearing material is approximately 5 to 25 feet below ground surface. The City of Simi Valley has a high water table at the west end of the valley and several extraction wells have been installed to pump down the water table when groundwater gets too high. Three wells sampled this year, all dewatering wells, located in the western half of the basin, have SO_4^{2-}, and TDS concentrations above the secondary MCL for drinking water and one well has elevated NO_3^-. All three samples also have concentrations of boron and chloride that exceed agricultural beneficial uses, but neither contaminant is above the primary MCL for drinking water. Figure 3-16 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Simi Valley basin.



Aerial photo showing the extent of the Simi Valley groundwater basin.

SIMI VALLEY BASIN

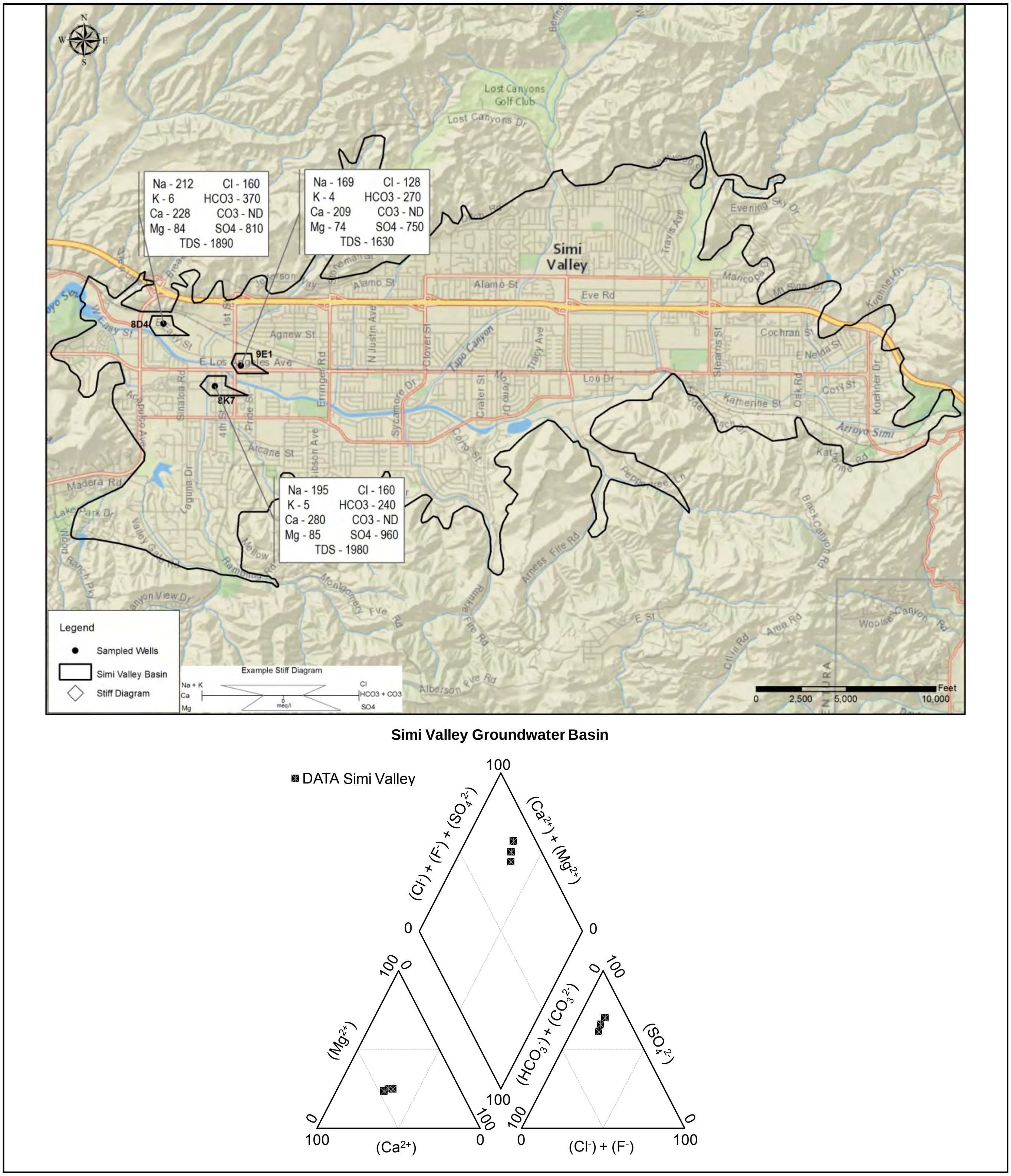
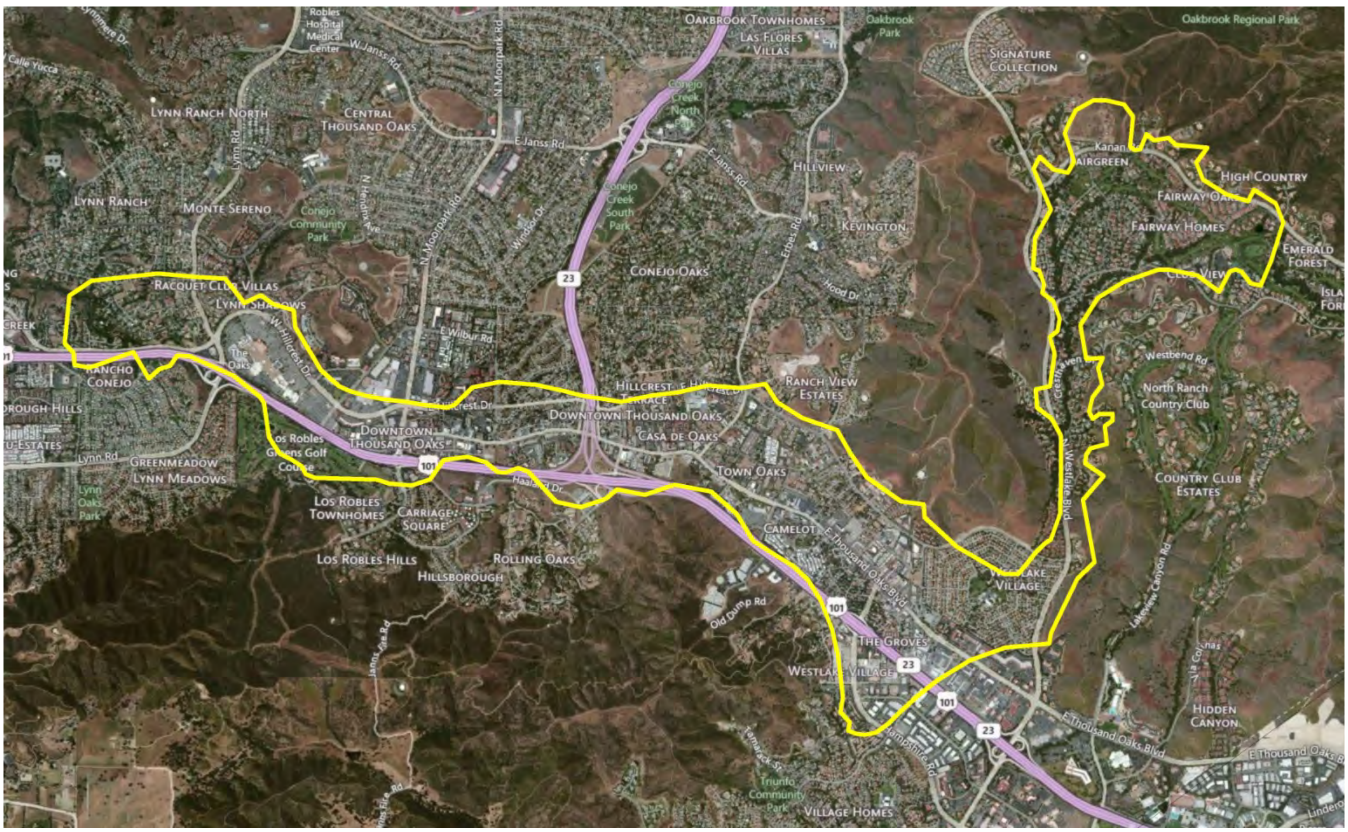


Figure 3-16: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

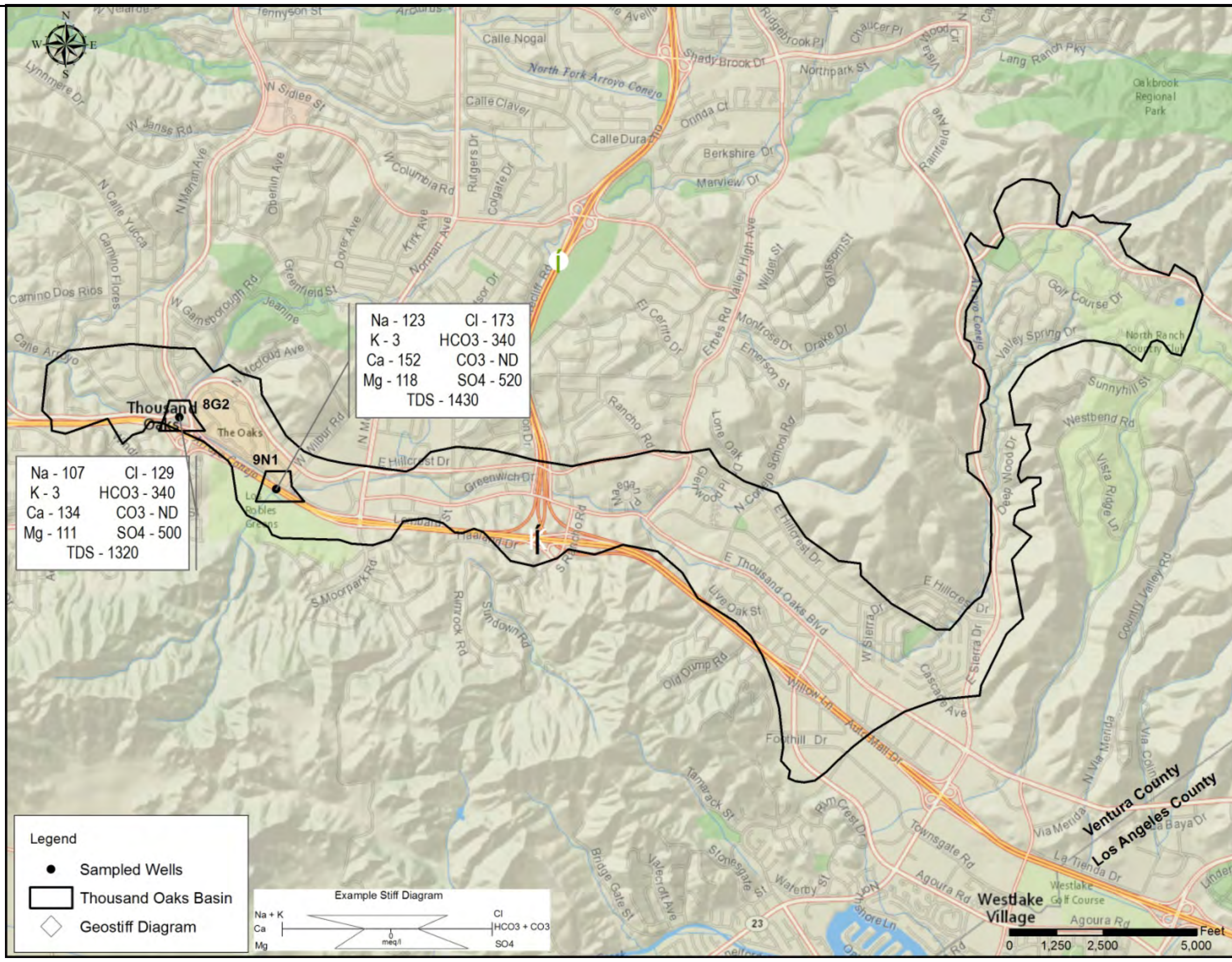
3.2.14 - Thousand Oaks Basin

The Thousand Oaks Basin has very few active water wells available for sampling. There are approximately 195 water supply wells in the Thousand Oaks Basin; 19 are active. Two wells were sampled in the basin this year, both at the west end of the basin; the chemistry is very similar. Concentrations of iron, sulfate and TDS are above the secondary MCL for drinking water in both of the wells and manganese is above the secondary MCL in one well. One water sample was analyzed for inorganic chemicals (Title 22 metals). None of the inorganic chemicals was above the primary MCL for drinking water. The depth to the water bearing unit is approximately 25 to 30 feet. Figure 3-17 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in Thousand Oaks basin.



Aerial photo showing the extent of the Thousand Oaks groundwater basin.

THOUSAND OAKS BASIN



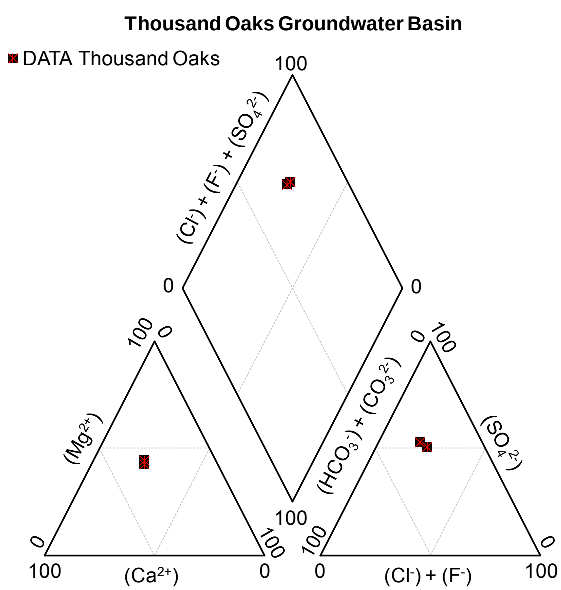
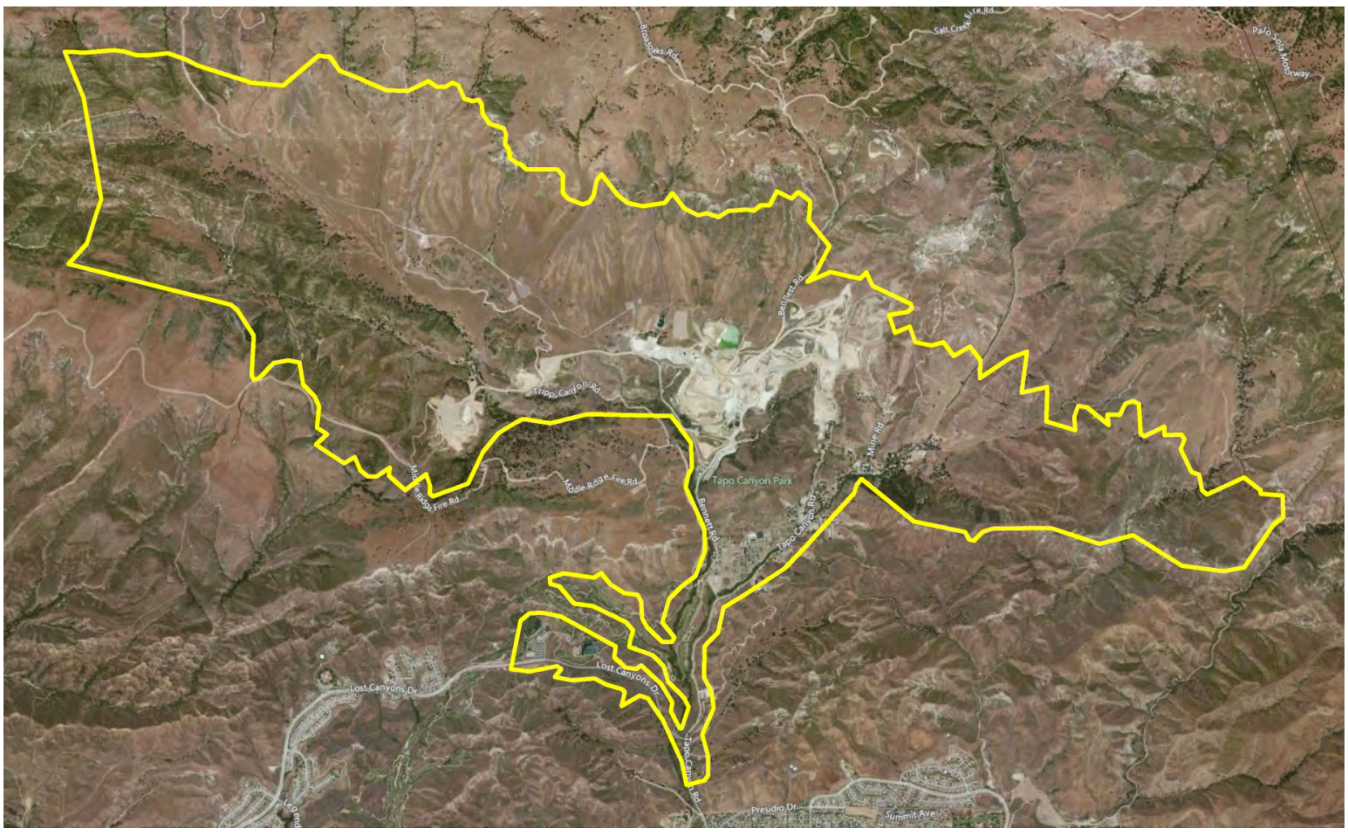


Figure 3-17: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

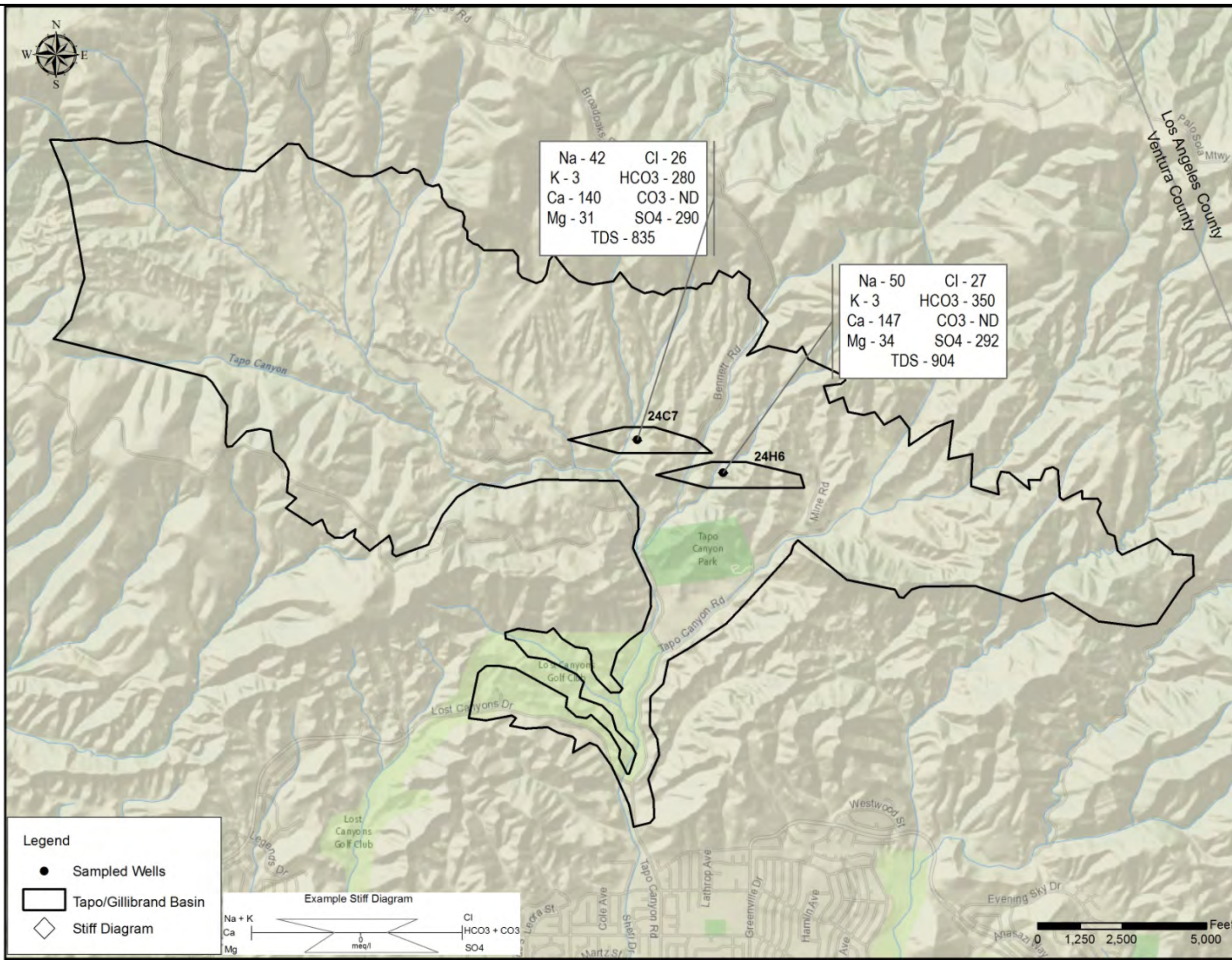
3.2.15 - Tapo/Gillibrand Basin

The Tapo/Gillibrand Basin is located to the north of Simi Valley and has very good groundwater quality. There are approximately 54 water supply wells in the Tapo/Gillibrand Basin; 42 are active. The City of Simi Valley operates several wells in the basin as a backup water supply. Two wells were sampled this year. TDS and SO_4^{2-} concentrations are above the secondary MCL for both samples; one has elevated iron (Fe) and manganese (Mn). One water sample was also analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the primary MCL for drinking water. Depth to the water bearing material is approximately 125 to 150 feet. Figure 3-18 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in Tapo/Gillibrand basin.



Aerial photo showing the extent of the Tapo/Gillibrand groundwater basin.

TAPO/GILLIBRAND BASIN



Gillibrand/Tapo Groundwater Basin

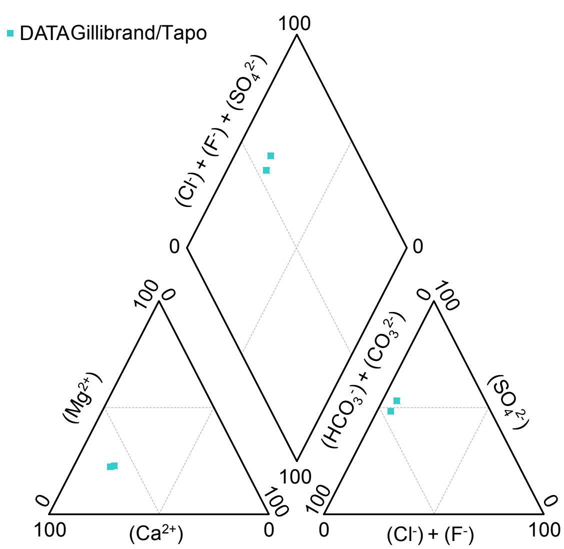
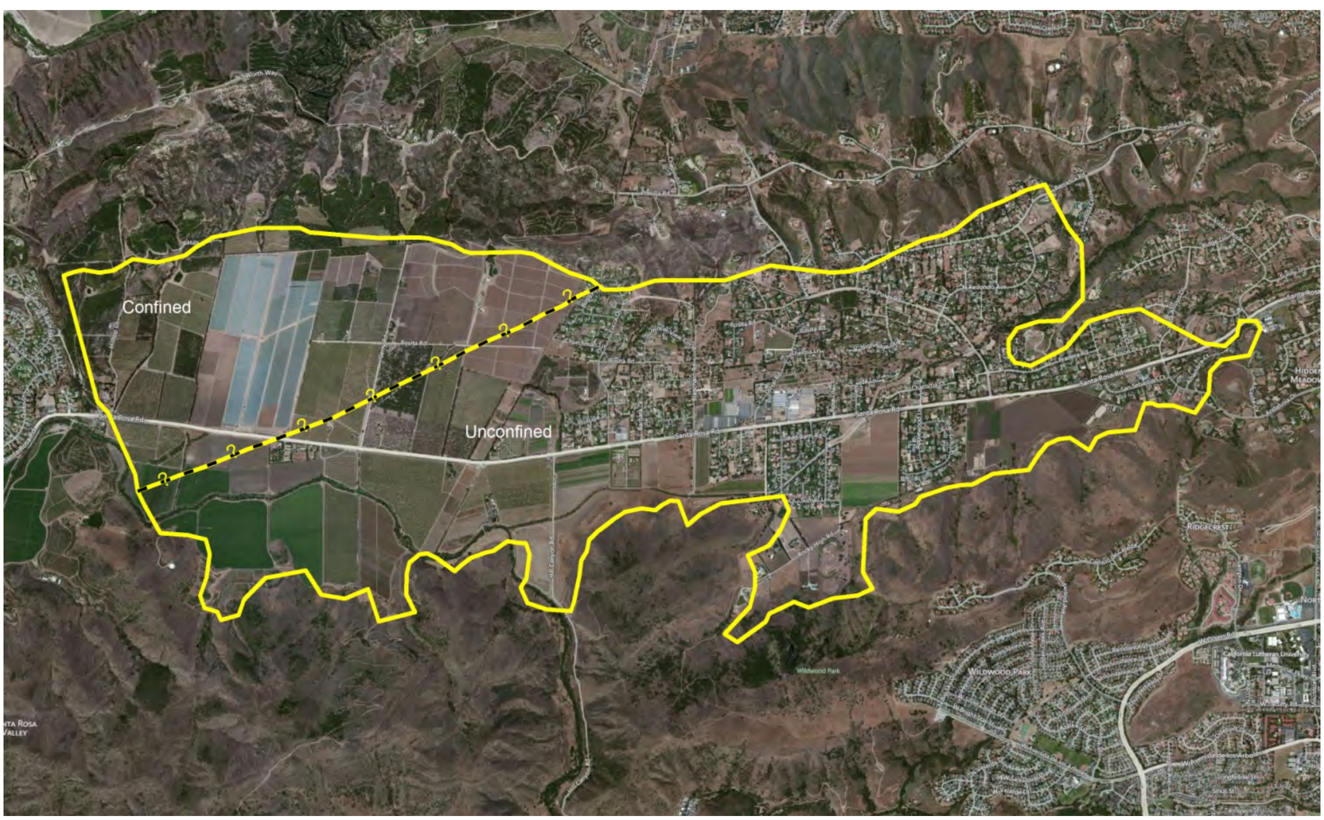


Figure 3-18: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.16 - Arroyo Santa Rosa Basin

The water bearing units of the Arroyo Santa Rosa Basin occupy almost the entire area beneath the Santa Rosa Valley, but the area west of the Bailey Fault can be considered to be hydrogeologically separate from the area east of the fault (1997 Santa Rosa Basin Groundwater Management Plan). 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 Arroyo Santa Rosa Basin has a large area dedicated to agricultural use and a high number of individual septic systems; two main sources of nitrate to the groundwater. A large portion of recharge to the basin is discharge from the Thousand Oaks Hill Canyon Wastewater Treatment Plant. There are approximately 99 water supply wells in the Arroyo Santa Rosa Basin; 33 are active. Water from seven of the eight wells sampled this year has nitrate (NO_3^-) concentrations higher than the primary MCL for drinking water. All eight wells have TDS concentrations above the secondary MCL with an average of 991 mg/l. Chloride (Cl^-) concentrations in 6 of the wells are above the level that can cause agricultural beneficial uses for sensitive plants to be impaired, but is not above the primary MCL for drinking water. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the primary MCL for drinking water. Depth to water bearing material is approximately 50 feet. Piper and stiff diagrams, Figure 3-19, show that water chemistry for all wells in the basin is similar. There is no dominant cation and only two samples have a dominant anion type of bicarbonate. Figure 3-19 also contains a piper diagram that shows comparison of water chemistry from Tierra Rejada and Arroyo Santa Rosa Basin groundwater. Chemistry in the two basins is similar but there is more chemistry variation in the Tierra Rejada Basin. Figure 3-19 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-})and sulfate (SO_4^{2-}) for the wells sampled in the Arroyo Santa Rosa basin.



Aerial photo showing the extent of the Arroyo Santa Rosa groundwater basin.

ARROYO SANTA ROSA BASIN

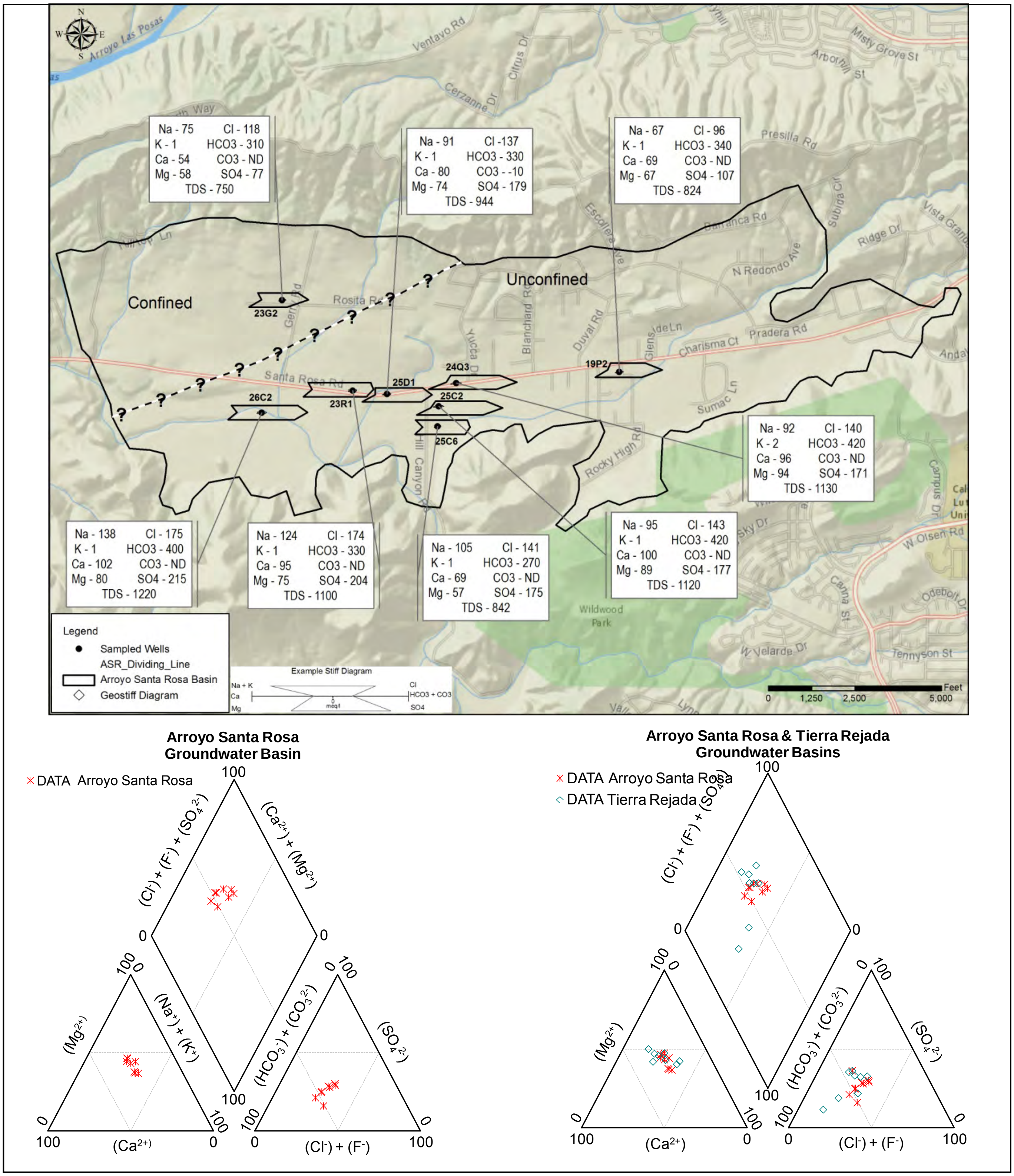


Figure 3-19: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

Figure 3-20 shows the geographic distribution of the wells sampled, with graduated symbols representing nitrate concentration for 2012. Figure 3-21 shows nitrate results for 1998 through 2012 in the same manner. The Groundwater Section has used three or more wells with nitrate concentrations above the state primary MCL in a given year as the criteria to classify the basin as nitrate-impacted. Comparison of the two shows that the Arroyo Santa Rosa Basin has remained nitrate impacted for approximately 13 years. Management practices now in place include limiting the number of large animals and generally restricting septic systems to lots greater than 2.875 acres. It is not clear that the management practices are having the desired effect but no groundwater samples had nitrate (NO_3^-) concentration above 113 mg/l and in previous years some wells have been as high as 292 mg/l.

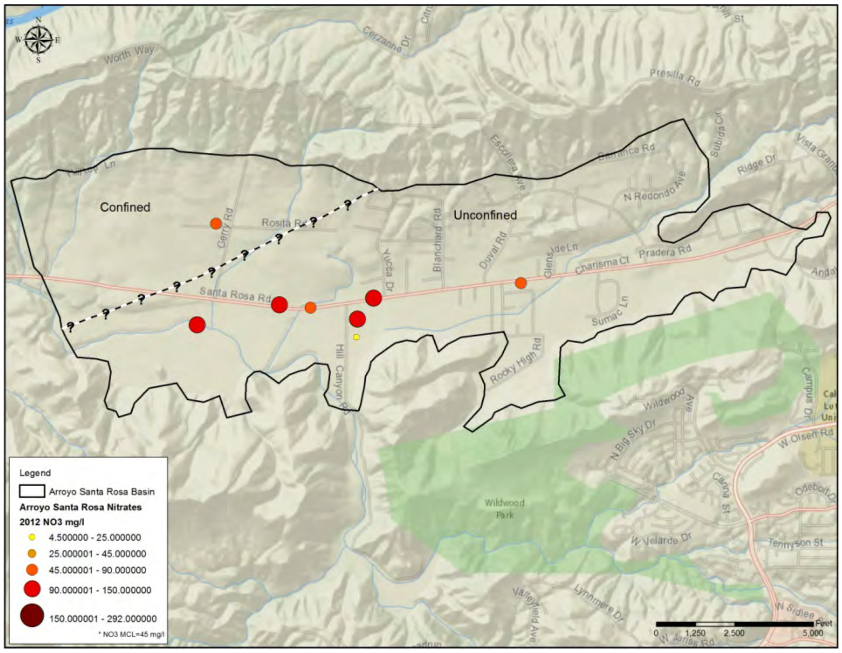


Figure 3-20: Map showing Nitrate results in mg/l for the year 2012.

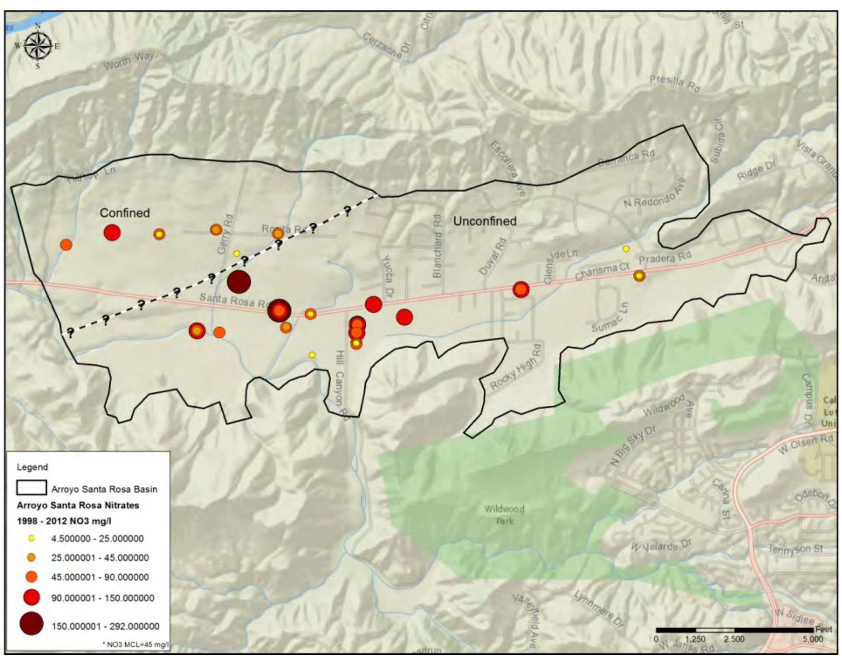
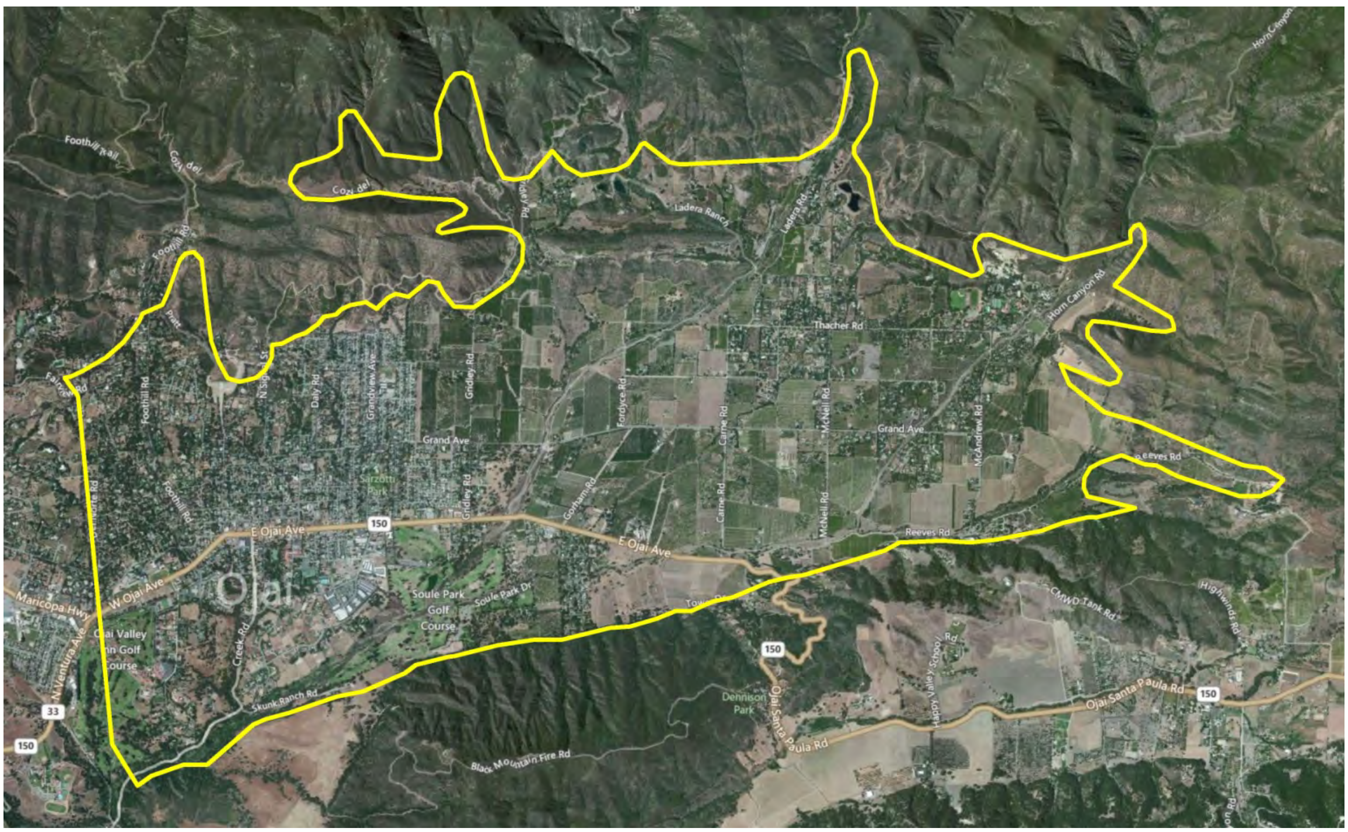


Figure 3-21: Map showing nitrate results for 1998 to 2012.

3.2.17 - Ojai Valley Basin

The aquifer system of the Ojai Valley Basin is considered unconfined except in the western end of the basin where a semi-confining to confining clay layer is present. The Ojai Valley Basin water quality is considered good. There are approximately 341 water supply wells in the Ojai Valley Basin; 185 are active. Average TDS is 812 mg/l and ranges from 671 to 1090 mg/l. Two wells have iron (Fe) concentrations above the secondary MCL for drinking water. Water samples from three wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the primary MCL for drinking water. Depth to water bearing material is generally between 25 to 30 feet below ground surface. Piper diagrams at the bottom of Figure 22 show that Ojai Valley groundwater chemistry is quite variable. Figure 3-22 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Ojai Valley basin.



Aerial photo showing the extent of the Ojai Valley groundwater basin.

OJAI VALLEY BASIN

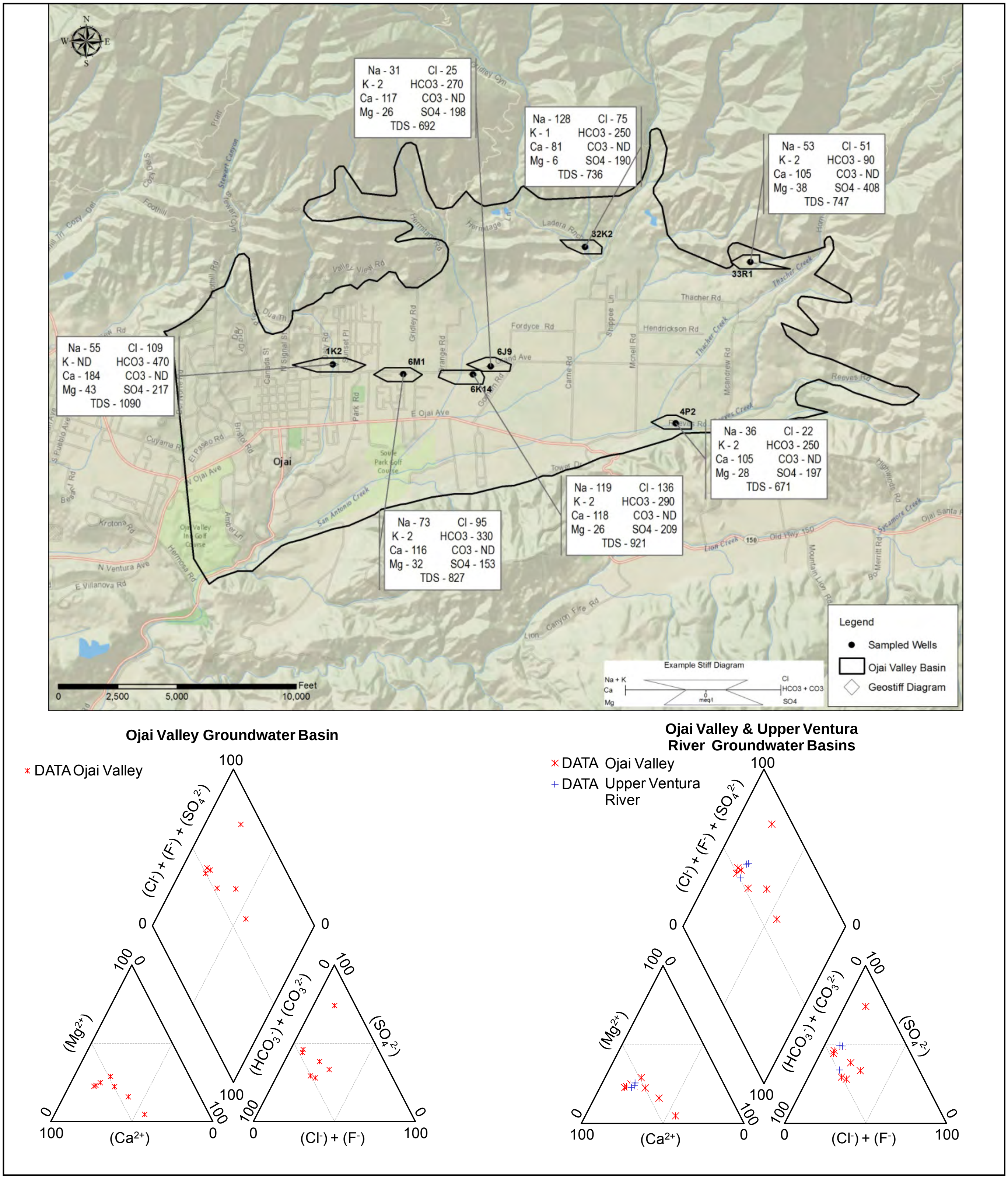
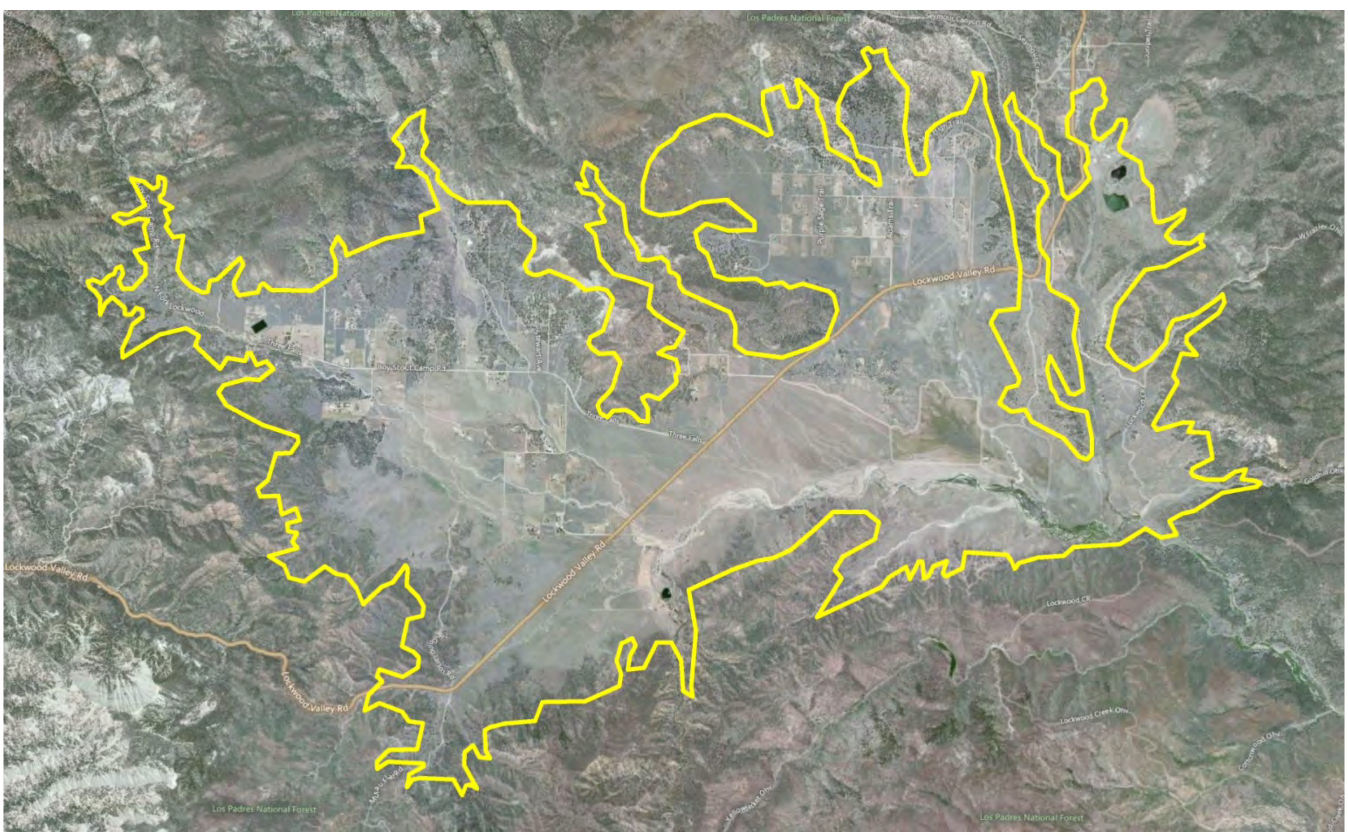


Figure 3-22: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

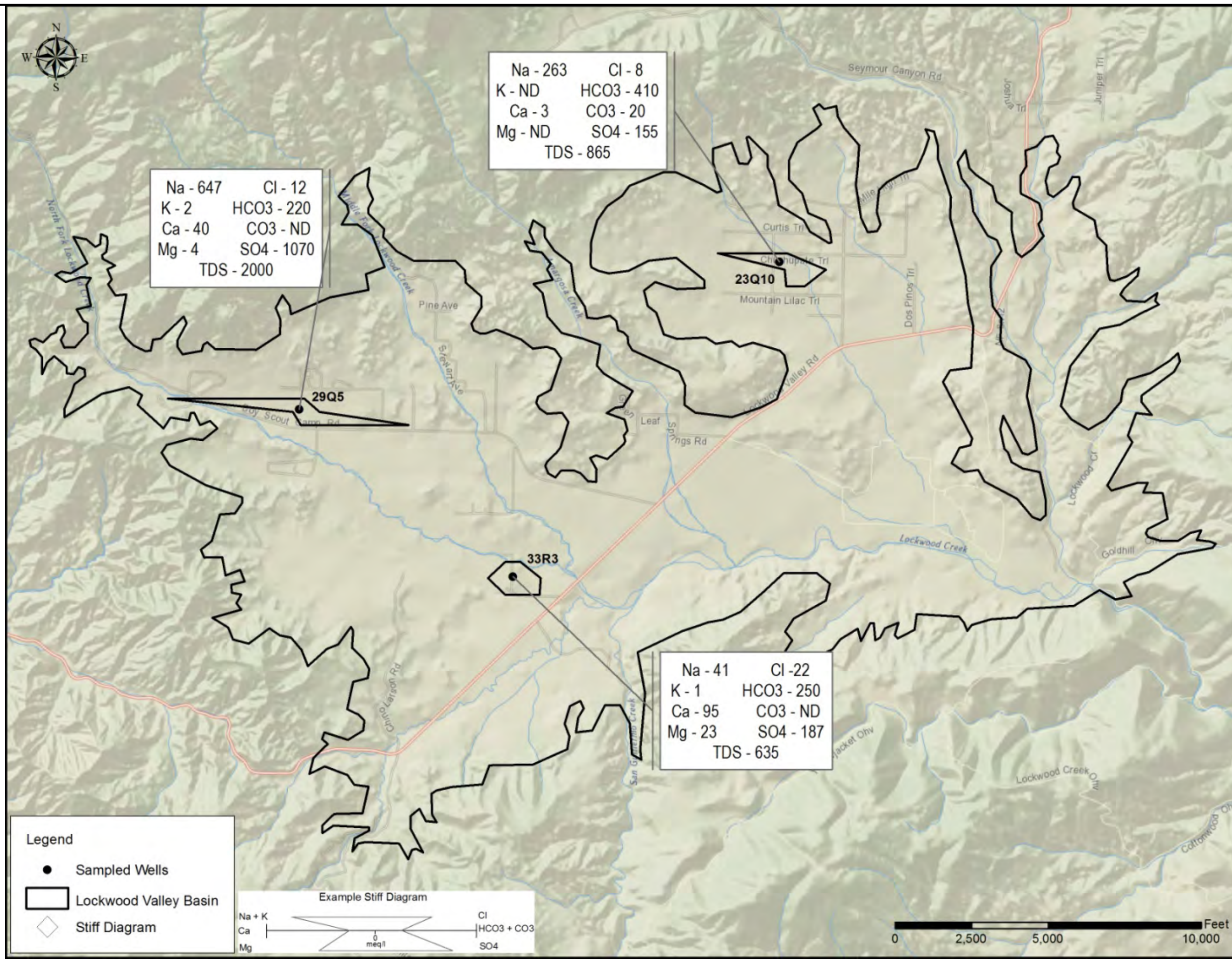
3.2.18 - Lockwood Valley Basin

The Lockwood Valley Basin groundwater quality ranges from good to unhealthful. The basin covers a large geographic area, approximately 34.1 square miles, and water bearing units vary. Depth to water bearing material is approximately 55 to 60 feet. There are approximately 269 water supply wells in the Lockwood Valley Basin; 218 are active. Piper and Stiff diagrams in Figure 3-23 show a variation in groundwater quality. Three wells were sampled this year and of those, all have TDS concentrations above the secondary MCL for drinking water and one has sulfate (SO_4^{2-}) above the secondary MCL. Samples from all three wells were also analyzed for inorganic chemicals (Title 22 metals). No inorganic constituents were above the primary MCL for drinking water. Water from all three wells was tested for radionuclides. The result for gross alpha on two of the samples was above 5 pCi/L; that level requires the sample to be analyzed for uranium. In 2004, the Drinking Water Branch of the California Department of Public Health issued an Initial Monitoring and MCL Compliance Determination flow chart. The flow chart is used to determine the source of gross alpha for determining compliance in community water systems. Based on the flow chart, naturally occurring uranium was determined to be the source of the gross alpha in these samples. The Groundwater section has not investigated the geologic source(s) of the radionuclides. Following the additional testing, radionuclides were determined to be below the MCL for drinking water. Water quality is best in wells perforated to a depth of less than 250 feet. Figure 3-23 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Lockwood Valley basin.



Aerial photo showing the extent of the Lockwood Valley groundwater basin.

LOCKWOOD VALLEY BASIN



Lockwood Valley Groundwater Basin

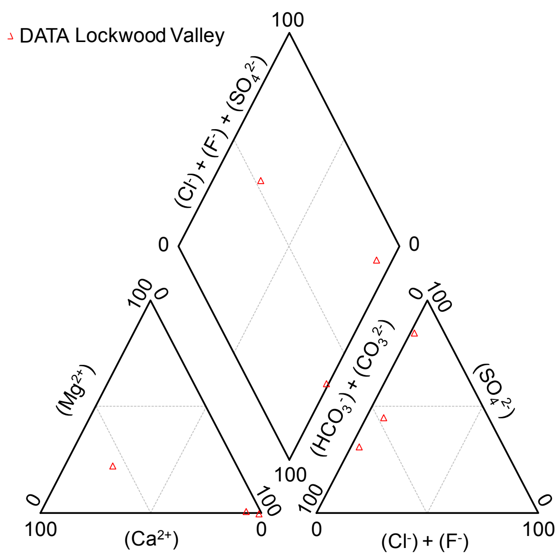


Figure 3-23: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

3.2.19 - Tierra Rejada Valley Basin

There are approximately 54 water supply wells in the Tierra Rejada Valley Basin; 29 are active. Eleven wells were sampled this year. All eleven have concentrations above the secondary MCL for TDS with an average of 806 mg/l. Nitrate concentrations in water samples from four of the wells are above the primary MCL with an average of 37.6 mg/l. For the third year in a row this basin has had more than three wells with high nitrate. Piper and Stiff diagrams show quite a bit of variation in water quality with well location, Figure 3-24. The major cations for the majority of the wells are calcium and magnesium and the major anions are sulfate and chloride. Two wells at the south east edge of the basin yield water that has considerably different chemistry. The major cations for those two wells are sodium and magnesium and the major anion is bicarbonate. Figure 3-24 also contains a piper diagram that shows comparison of water chemistry from 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 bicarbonate. Water samples from four wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical concentration was above the primary MCL for drinking water. Depth to water bearing materials varies between 20 to 80 feet. Figure 3-24 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Tierra Rejada basin.

Aerial photo showing the extent of the Tierra Rejada Valley groundwater basin.

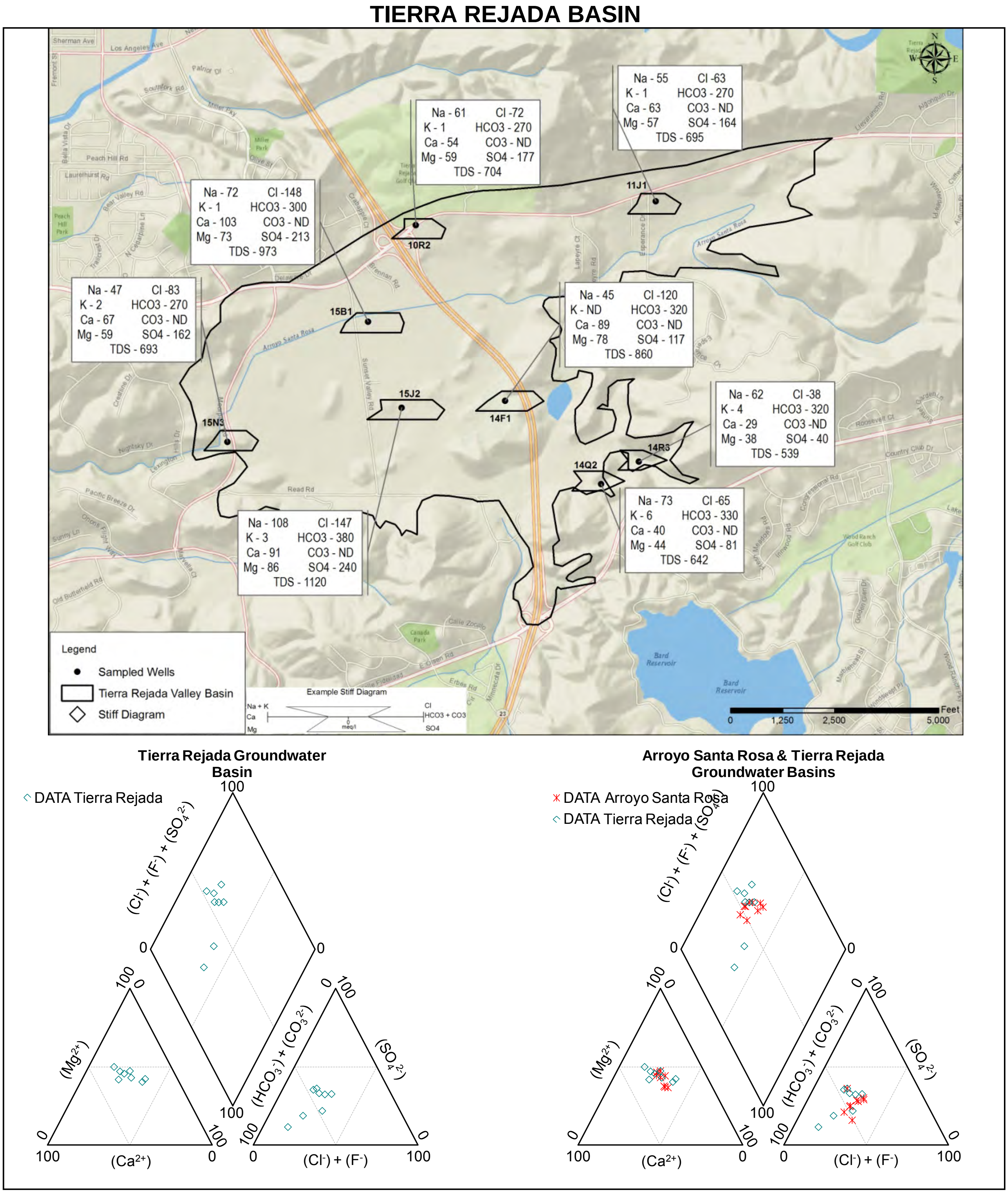


Figure 3-24: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

Figure 3-25 on the following page shows nitrate concentrations for wells sampled in Tierra Rejada Basin in 2012. Groundwater from three of the wells sampled this year has a nitrate concentration that exceeds the primary MCL for drinking water, thus, based on the criteria used by the Groundwater Section (See discussion in Arroyo Santa Rosa Basin section) for the third year in a row, the Tierra Rejada Basin should be considered nitrate impacted.

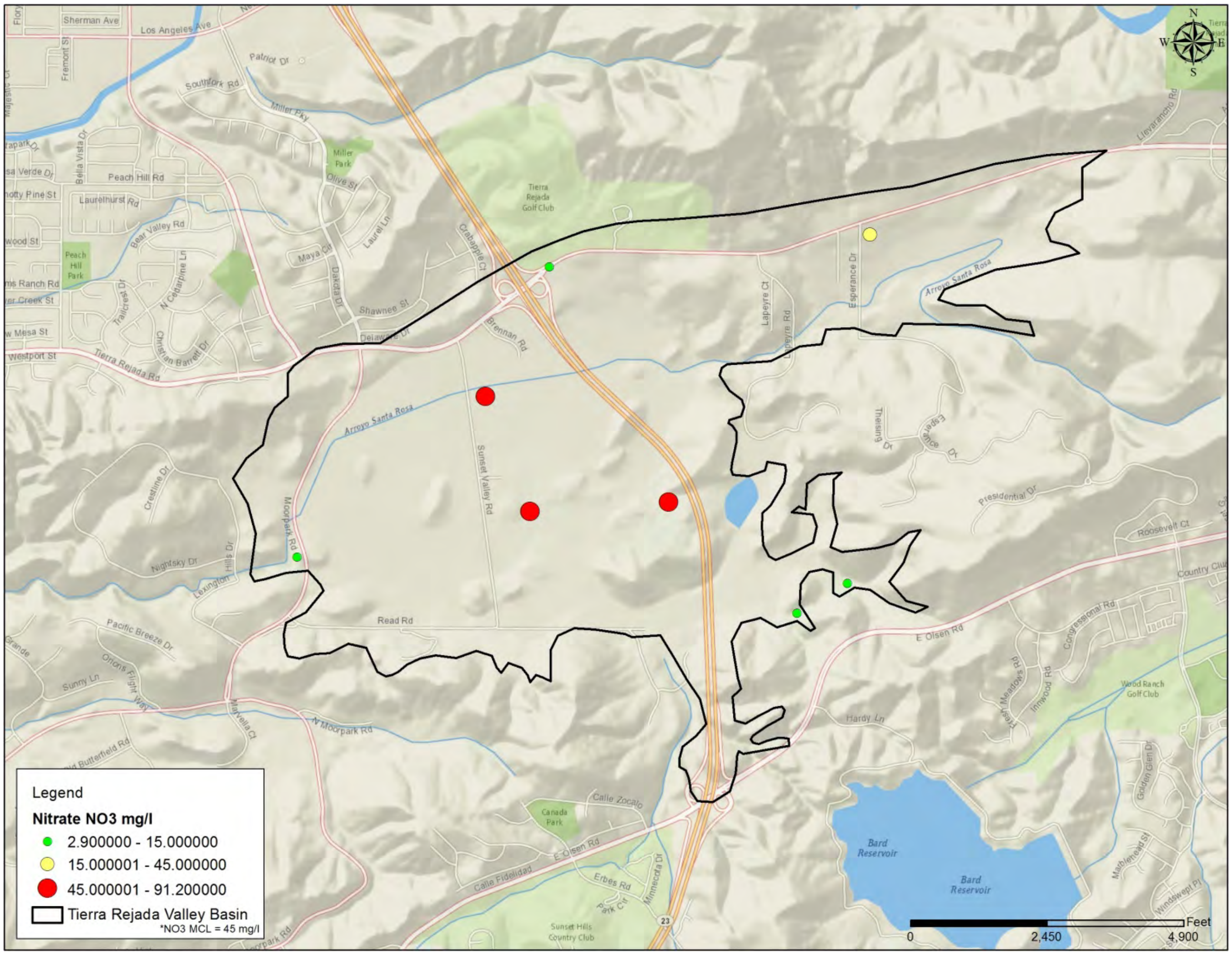
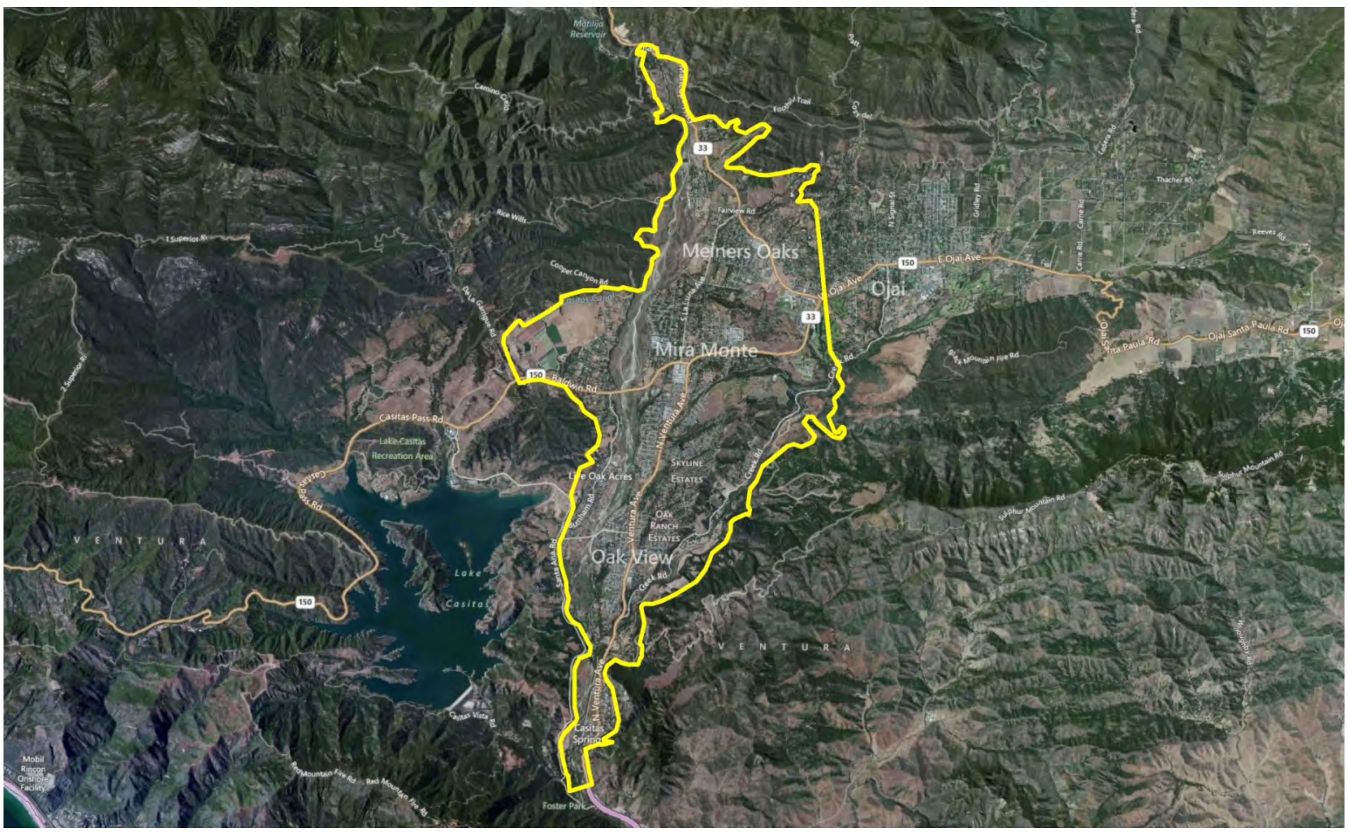


Figure 3-25: Map showing nitrate concentrations (mg/l). Three of the eight wells sampled this year have a nitrate concentration above the MCL for drinking water.

3.2.20 - Upper Ventura River Basin

The Upper Ventura River Basin is mainly composed of thin alluvial deposits. Past county reports have included Lake Casitas within the boundary for the Upper Ventura River Basin. We no longer consider the saturated alluvium beneath the lake as an aquifer so we have excluded that area from our basin map. There are approximately 344 water supply wells in the Upper Ventura River Basin; 165 are active. The wells sampled are all less than 125 feet deep, and all have good water quality. All three wells sampled have TDS concentrations that exceed the secondary MCL for drinking water, with an average concentration of 758 mg/l. One well also has an iron (Fe) concentration that exceeds the secondary MCL for drinking water. Piper and Stiff diagrams (Figure 3-26) show comparisons of the water chemistry for the Upper Ventura River Basin. The northernmost and southernmost wells that were sampled are in the flood plain of the Ventura River.

Figure 3-26 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Upper Ventura River basin.



Aerial photo showing the extent of the Upper Ventura River groundwater basin.

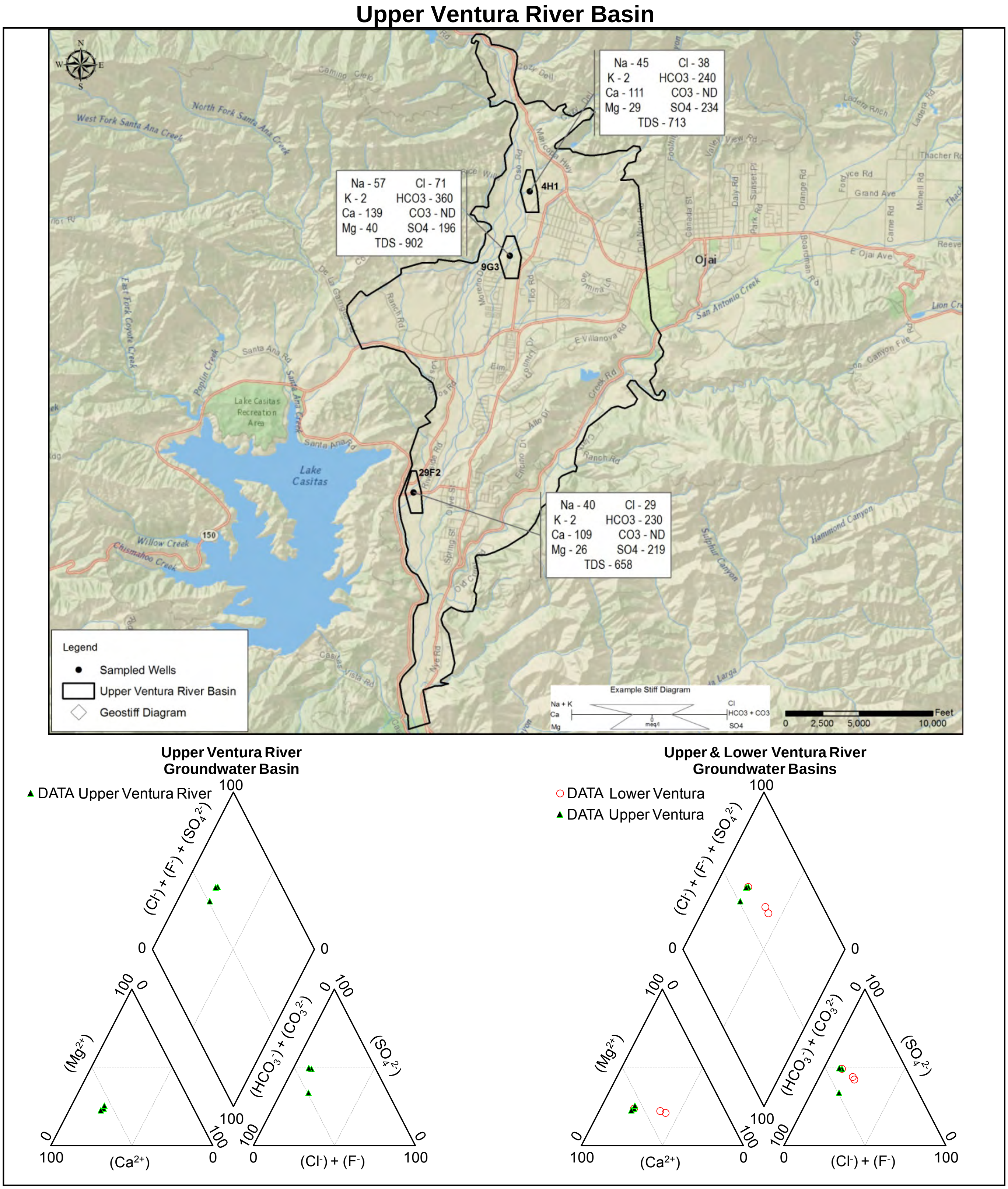


Figure 3-26: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagrams.

3.2.21 - North Coast Basin

The North Coast Basin does not fit the definition of a basin based solely on the Glossary of Geology definition that says an aquifer or aquifer system having well defined boundaries and more or less definite areas of recharge and discharge. The North Coast Basin consists of narrow, thin strips of permeable sediments and marine terrace deposits along the coastline from Rincon Creek to just north west of the Ventura River. There are only 8 active water supply wells in the North Coast Basin with the majority in the northwest portion along Rincon Creek. Water samples were collected from three wells at the northwest end of the basin. Water from one well has an iron concentration above the secondary MCL for drinking water; all samples have TDS above the secondary MCL, and one has a sulfate concentration above the secondary MCL. The piper and stiff diagrams (Figure 3-27) show that the water chemistry from the three samples is similar; none has a dominant anion or cation. Figure 3-27 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the North Coast basin.

Aerial photo showing the extent of the North Coast groundwater basin.

NORTH COAST BASIN

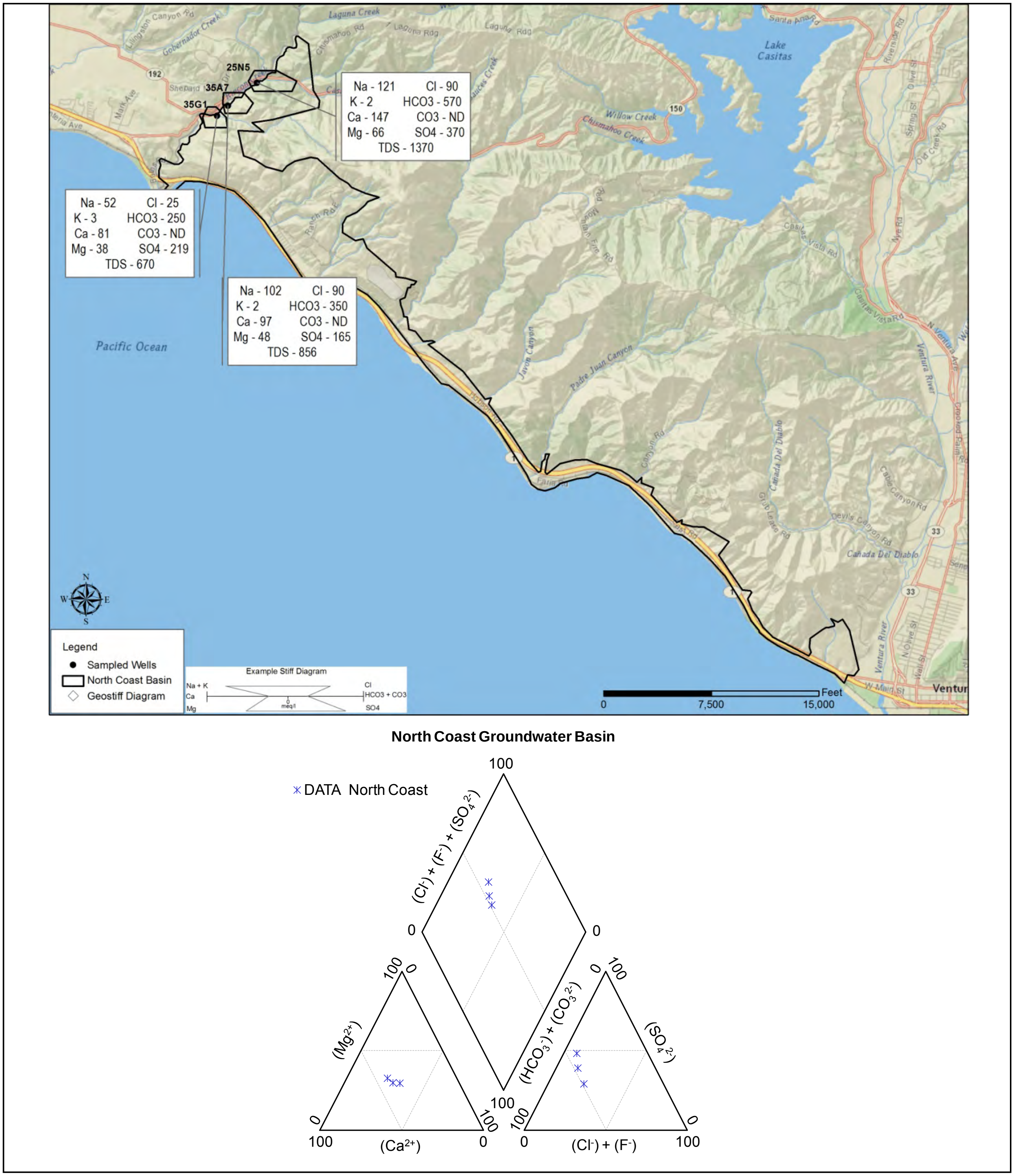
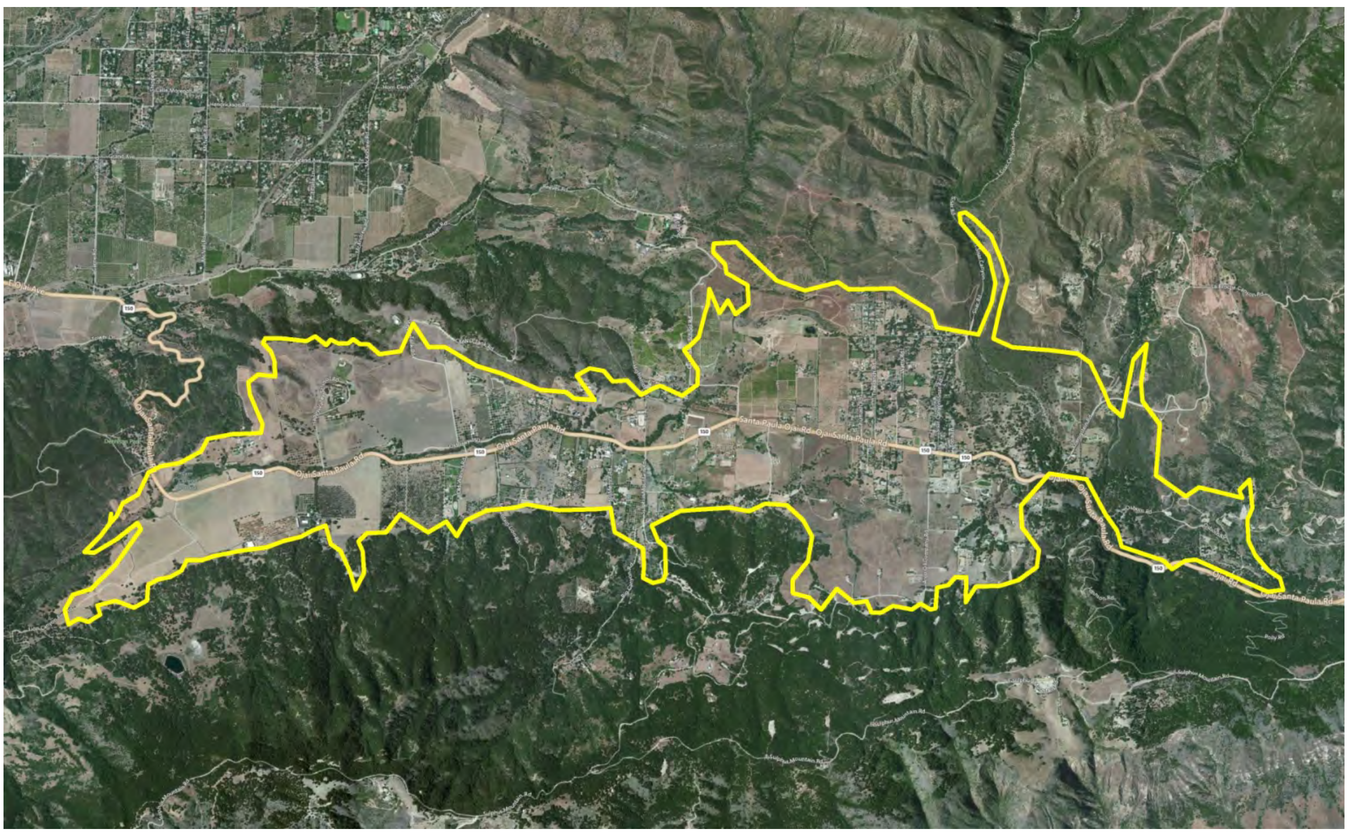


Figure 3-27: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents and piper diagram.

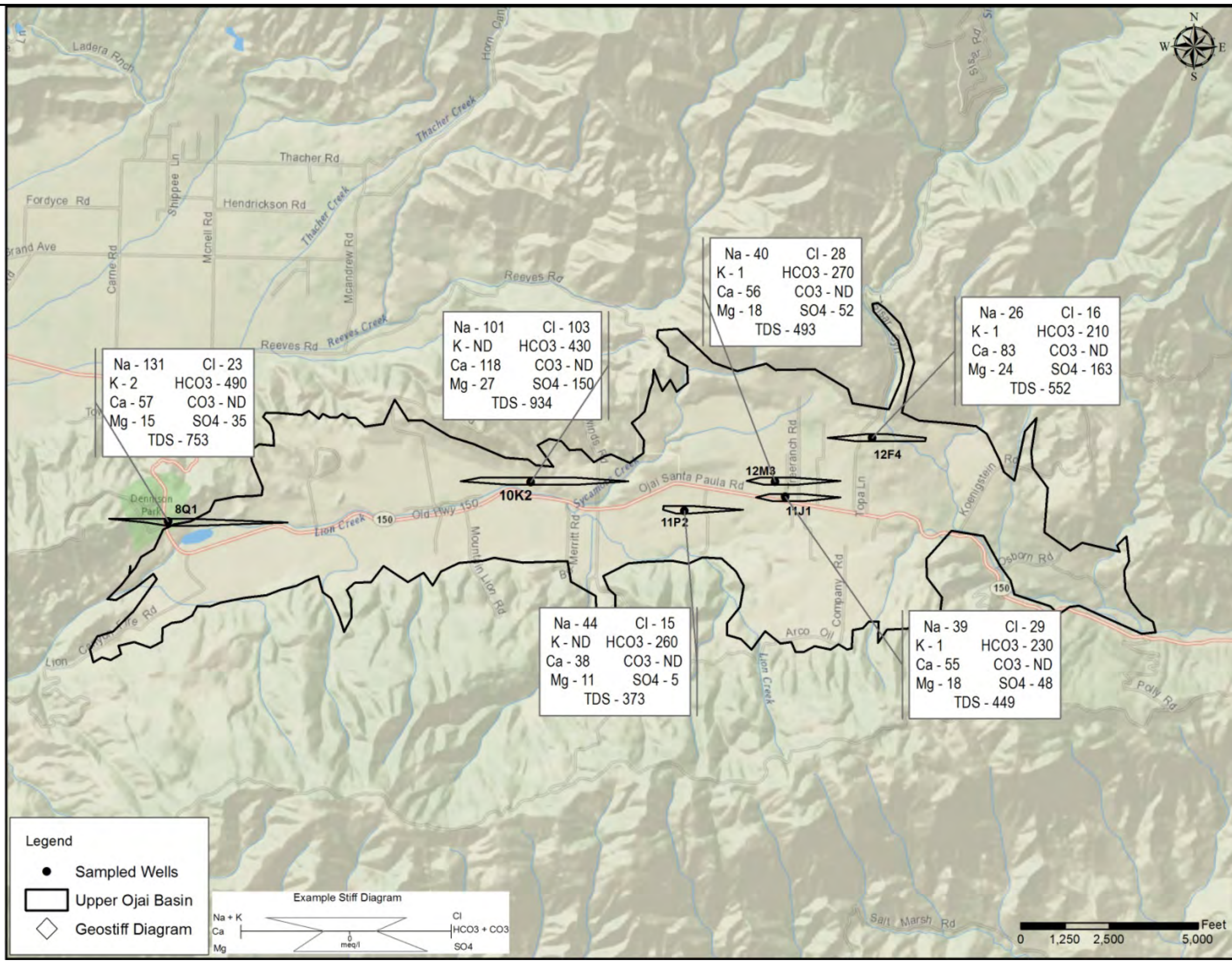
3.2.22 - Upper Ojai Basin

The Upper Ojai Basin is a small, linear valley southeast of and at a higher elevation than the Ojai Valley Basin. Groundwater quality is considered good, but varies seasonally, usually better during winter months. Historic average TDS is 549 mg/l. There are approximately 149 water supply wells in the Upper Ojai Basin; 100 are active. Groundwater from the wells sampled this year has an average TDS concentration of 592, a little higher than the historical average. One well has an iron concentration well above the secondary MCL but no other constituents were above the MCL for drinking water. Water samples from three wells were analyzed for inorganic chemicals (Title 22 metals). No inorganic chemical was above the primary MCL for drinking water. Piper and stiff diagrams (Figure 3-28) show variation in the groundwater chemistry of the basin, but all have bicarbonate (HCO_3^-) as the dominant anion (different than most of Ventura County wells sampled) and most have calcium (Ca^{2+}) as the dominant cation. The average thickness of water bearing deposits is approximately 60 feet and is encountered approximately 45 to 60 feet below ground surface. Figure 3-28 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled.



Aerial photo showing the extent of the Upper Ojai groundwater basin.

UPPER OJAI BASIN



Upper Ojai Groundwater Basin

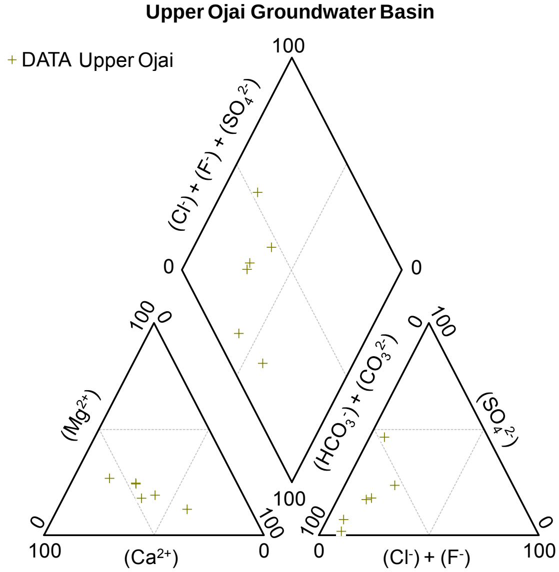
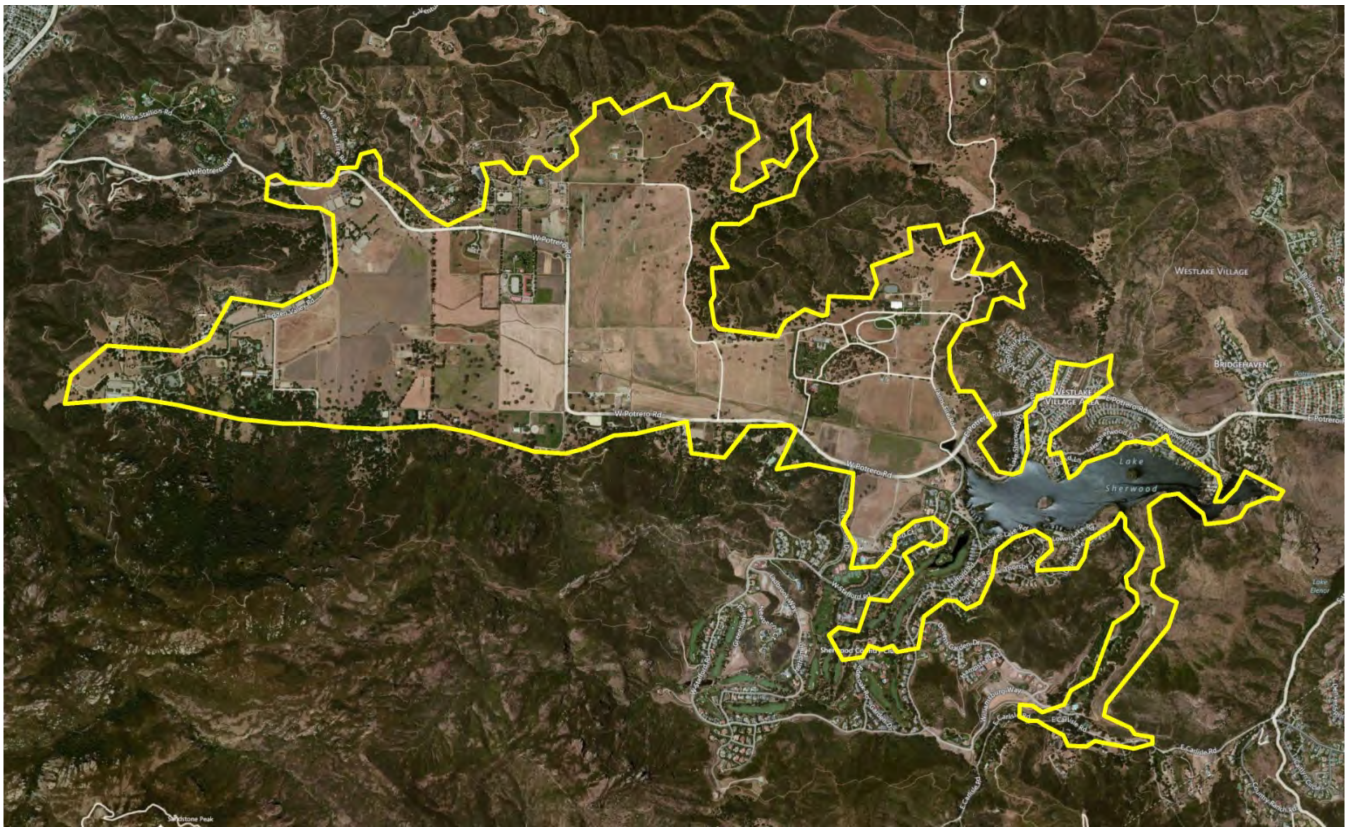


Figure 3-28: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

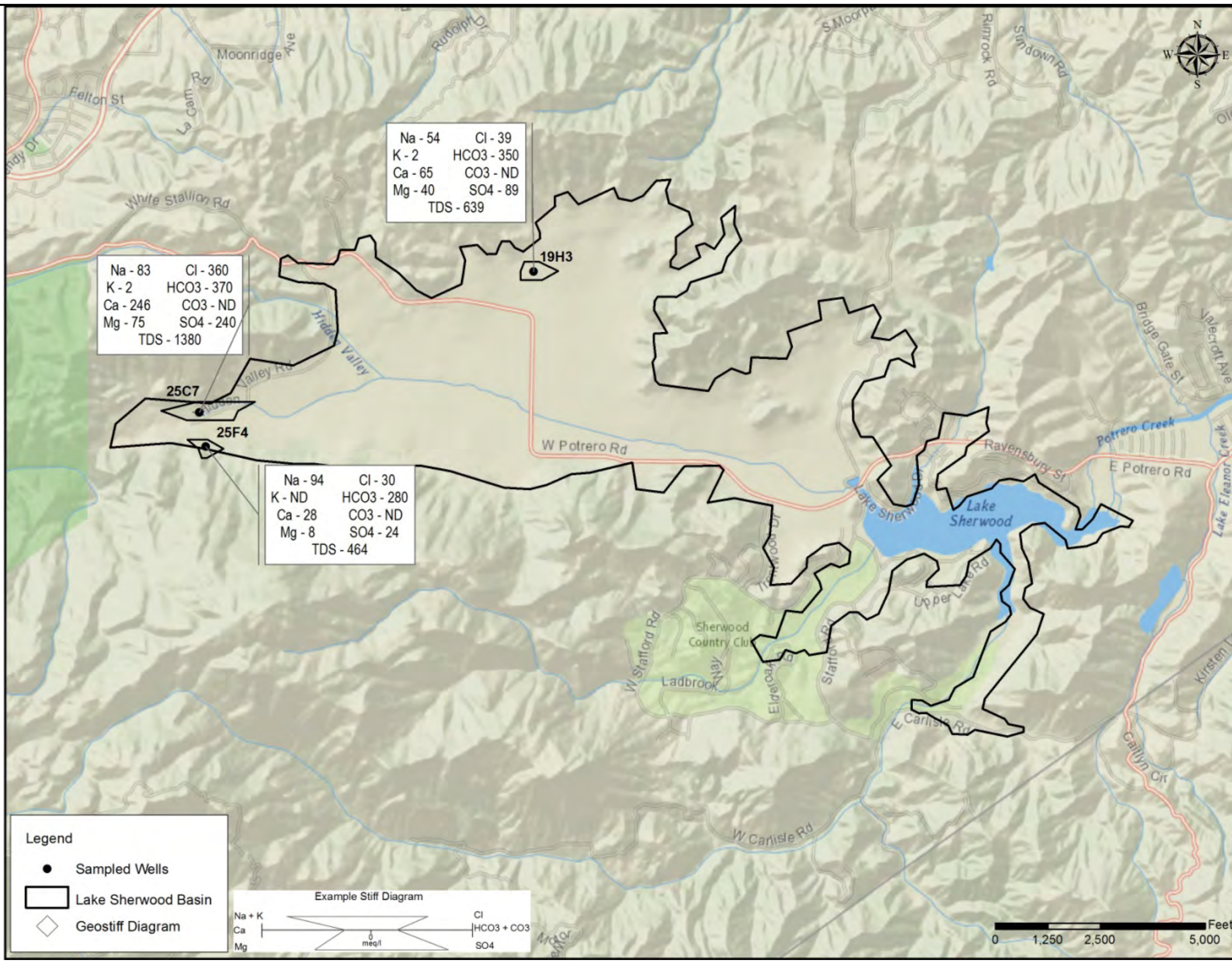
3.2.23 - Sherwood Basin

The Sherwood Basin consists mainly of fractured volcanic rock providing inconsistent groundwater supply and quality. There are approximately 155 water supply wells in the Sherwood Basin; 99 are active. Three wells were sampled and analyzed this year. Manganese is above the secondary MCL in one well; iron and TDS are above the secondary MCL in all three wells. TDS concentrations range from 464 to 1380 mg/l with an average of 828 mg/l for wells sampled this season. Piper and stiff diagrams (Figure 3-29) show the variation in water chemistry in the basin. Figure 3-29 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^+), potassium (K^+), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^-), bicarbonate (HCO_3^-), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Sherwood basin.



Aerial photo showing the extent of the Lake Sherwood groundwater basin.

SHERWOOD BASIN



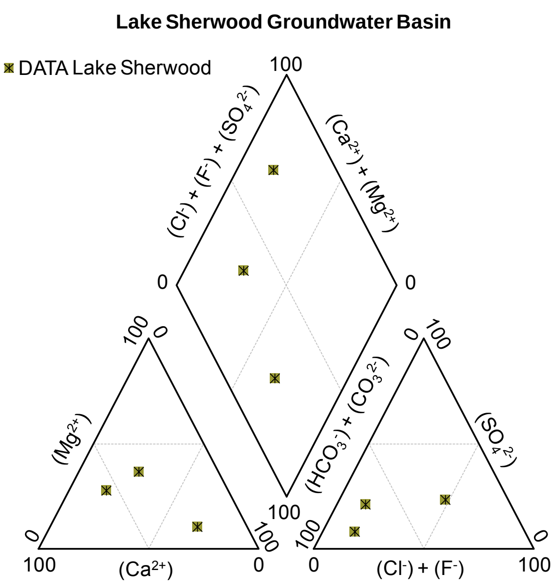
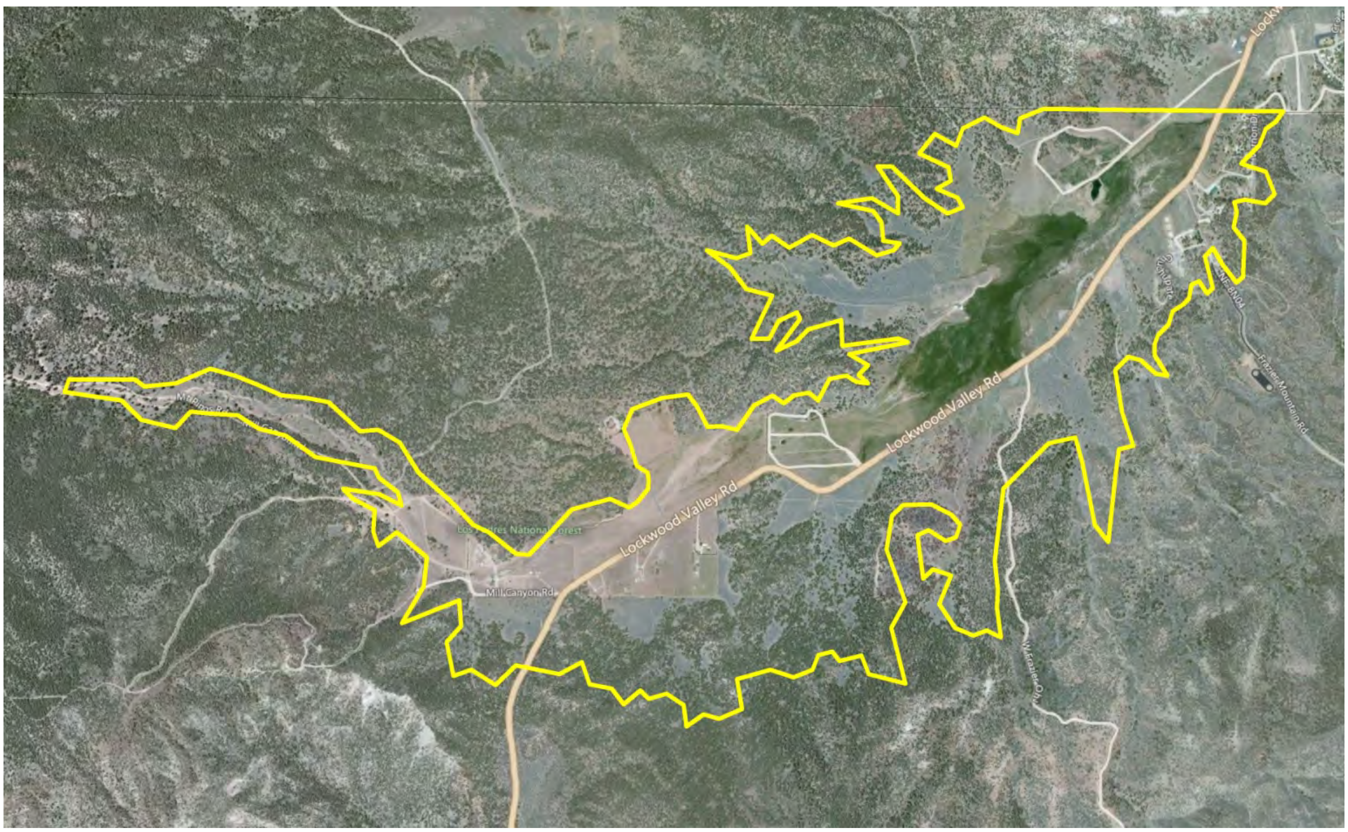


Figure 3-29: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

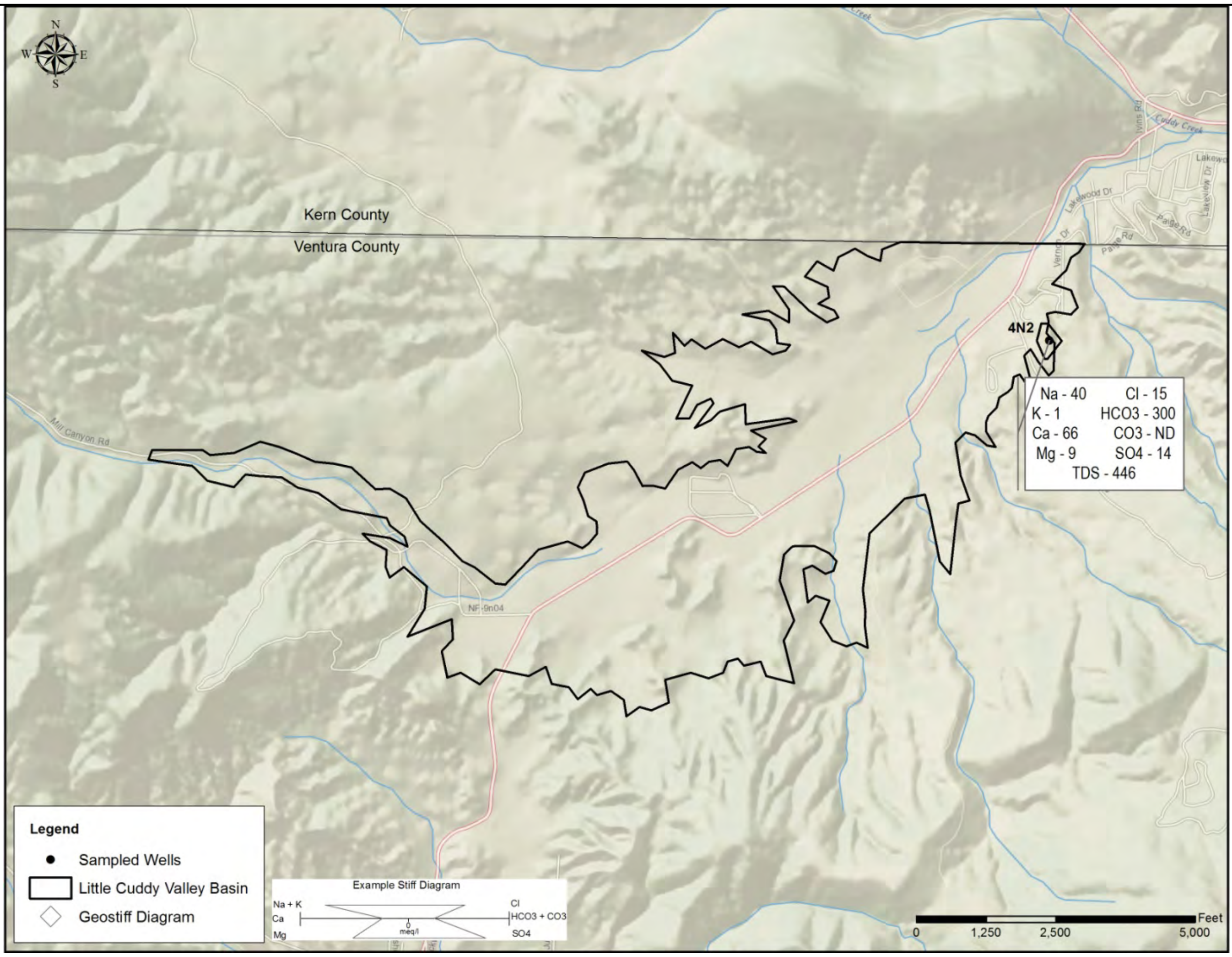
3.2.24 - Little Cuddy Valley Basin

The Little Cuddy Valley Basin is located in the northeastern part of Ventura County near the Kern County Line. Groundwater bearing layers consist of permeable sediment lenses in the Quaternary and Tertiary rocks and Holocene shallow alluvium with the syncline that makes up the valley floor. Depth to water bearing material is approximately 20 to 30 feet. Historically groundwater quality has been considered very good. There are approximately 29 water supply wells in the Little Cuddy Valley Basin; 26 are active. Only one well was sampled in the basin. That water sample was analyzed for general minerals, inorganic chemicals (Title 22 metals) and gross alpha. No constituent was above the primary or secondary MCL for drinking water. Figure 3-30 shows approximate well locations and concentrations of total dissolved solids (TDS), sodium (Na^{+}), potassium (K^{+}), calcium (Ca^{2+}), magnesium (Mg^{2+}), chloride (Cl^{-}), bicarbonate (HCO_3^{-}), carbonate (CO_3^{2-}) and sulfate (SO_4^{2-}) for the wells sampled in the Little Cuddy Valley basin.



Aerial photo showing the extent of the Little Cuddy Valley groundwater basin.

LITTLE CUDDY VALLEY BASIN



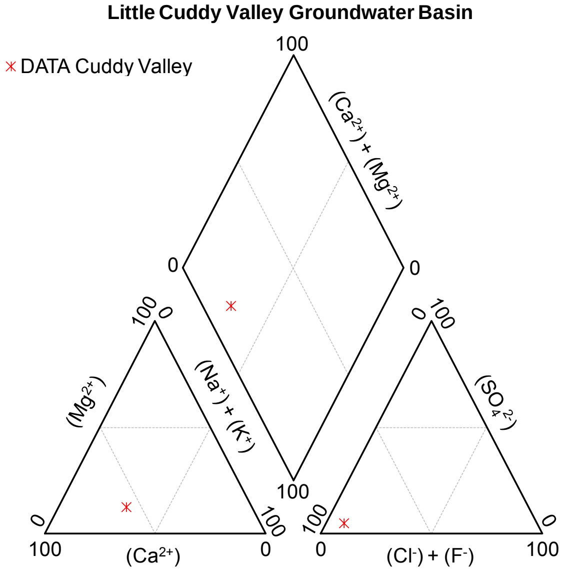


Figure 3-30: Map showing approximate location of sampled wells with concentrations (mg/l) of selected inorganic constituents.

Section 4.0
Water Quantity

4.1 – Groundwater

The following sub-sections describe the Groundwater Section's annual groundwater level monitoring program, involvement in the State CASGEM program, as well as, a general overview of water use in the County for 2012.

4.1.1 – CASGEM Program

The California Statewide Groundwater Elevation Monitoring (CASGEM) Program was developed by the Department of Water Resources (DWR) in response to the passing of Senate Bill Number 6 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 demonstrating seasonal and long-term trends in groundwater elevations. DWR is directed to make the resulting information readily and widely available. 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 the many, established local long-term groundwater monitoring and management programs.

The Ventura County Watershed Protection District (VCWPD) acts as the Umbrella Monitoring Entity for Ventura County. The Groundwater Section collects water level data measured by other agencies and compiles it with water level measurements taken by Groundwater Staff during the quarterly water level measurement runs and uploads it to the CASGEM website a minimum of two times per year.

4.1.2 – Water Level Measurements

Groundwater Section staff, and several water districts and purveyors measure water levels in production and monitoring wells throughout the County. Changes in water levels are tracked and help determine change in storage, and to track trends in groundwater extraction and recharge. Last year, water levels were measured quarterly in approximately 200 wells throughout the County. In the southern half of the County, water levels were measured four times, while in the more remote northern half, wells are monitored twice each year. "Key" wells for seventeen of the largest groundwater basins in the County have been established. A key well is a well selected as one giving the most representational data for the basin, or for a specific aquifer in a basin. Key wells are chosen based on their location in the basin, and availability of construction information and historical water level data.

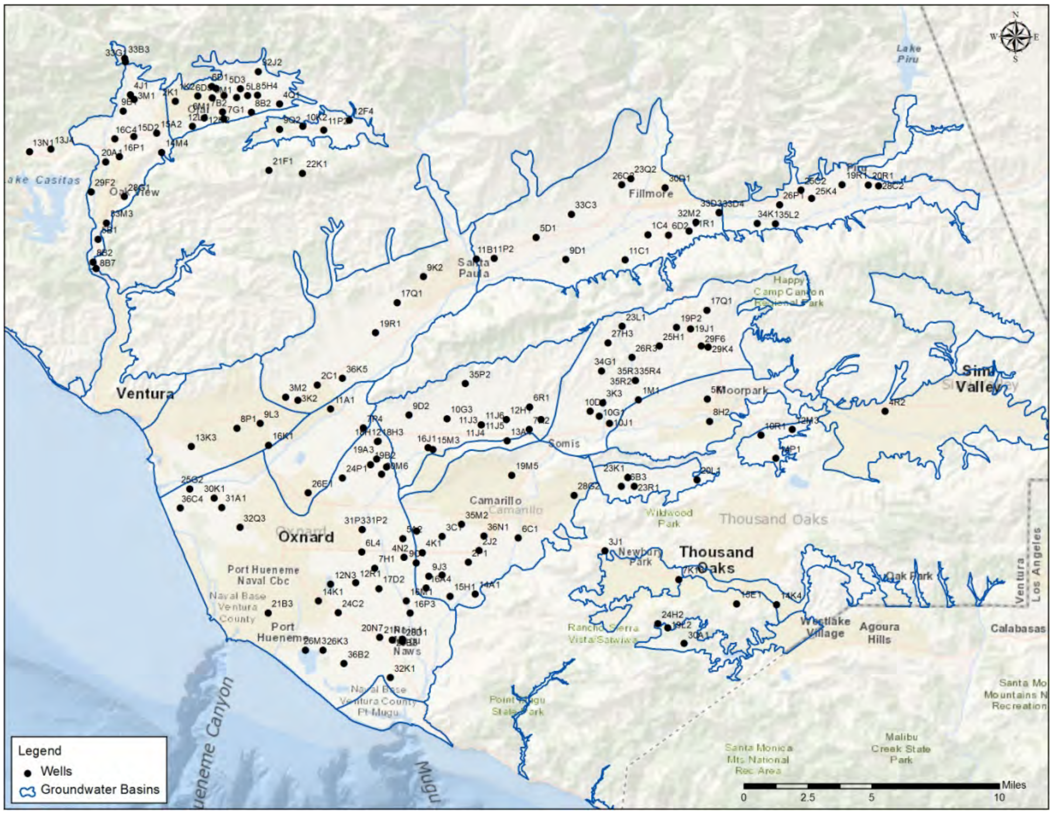


Figure 4-1: Water level wells measured in the southern half of the County.

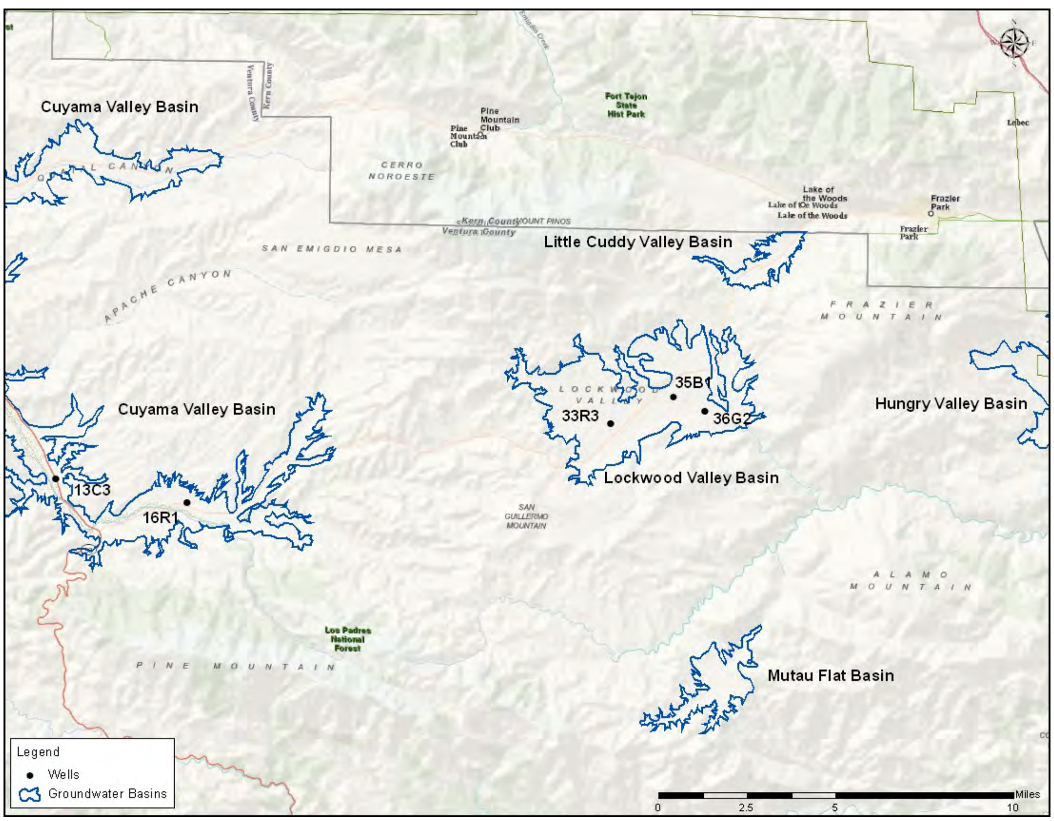


Figure 4-2: Water level wells measured in the northern half of the County.

4.1.3 – Water Level Hydrographs

The Groundwater Section maintains a database containing current and historical water levels for wells throughout the County. The database produces hydrographs for measured wells and can be used to show fluctuations in groundwater levels on a yearly basis or track long-term trends in a basin over decades. This data along with climate, stream flow, groundwater recharge, quality and pumping data can be used to determine groundwater conditions in the County. Hydrographs for all "key" water level wells are shown in Appendix B. An example hydrograph for Well No. 01N21W02J02S is shown below (Figure 4-3).

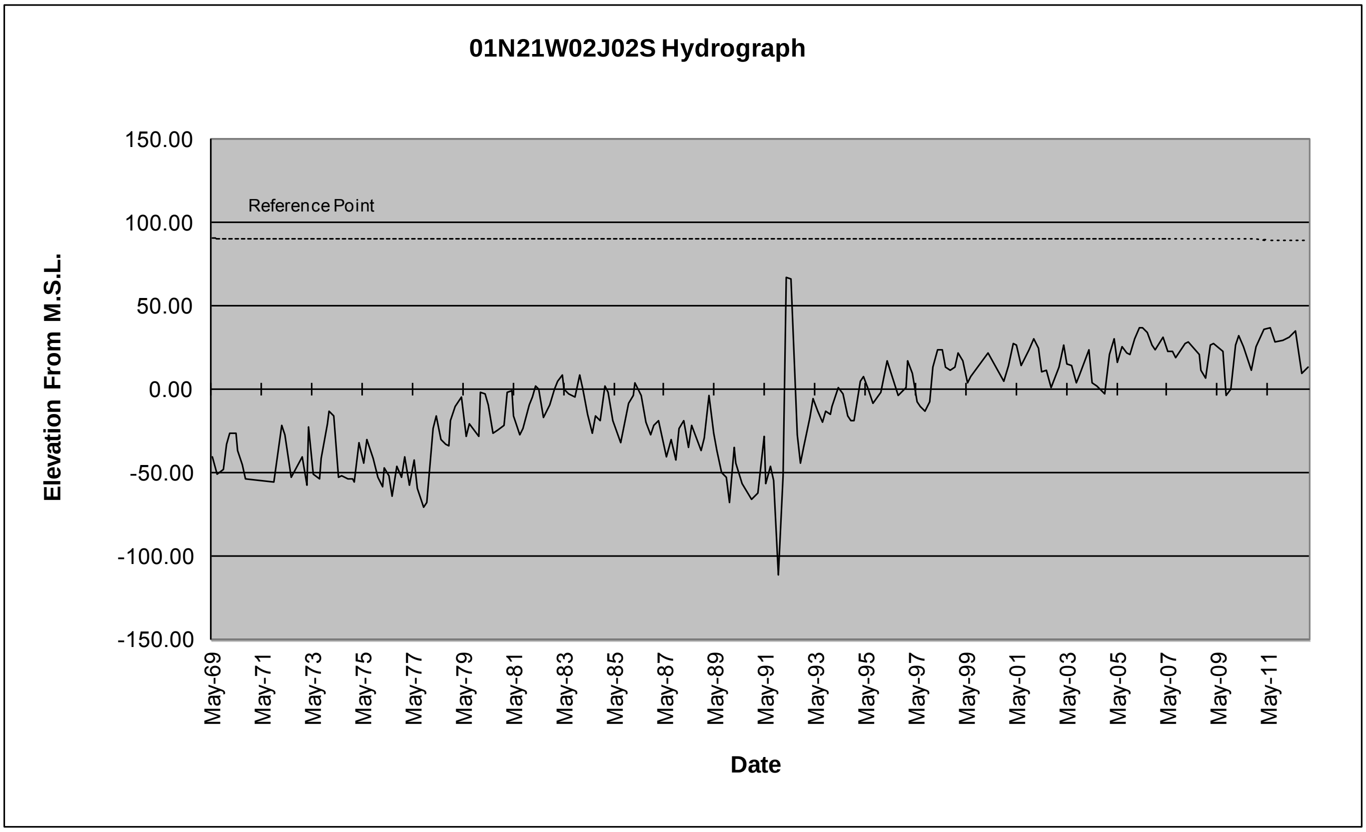


Figure 4-3: Water level hydrograph for Well No. 01N21W02J02S located in the Pleasant Valley basin.
*reference point – the elevation of the measuring point of the well.

4.1.4 – Summary of Changes to Spring Depth to Groundwater in Key Wells

The following summary is based on information gathered from key wells from major groundwater basins as shown in Table B-2 in Appendix B. The increase or decrease in water level for the year and the water level data referred to is the spring measurement or the first measurement of the year for those wells measured twice each year.

The Forebay area of the Oxnard Plain, responds quickly to seasonal and annual changes in precipitation and recharge. The water elevation in the Forebay area key Well No. 02N22W12R01S (UWCD) was down 30.5 feet from the 2011 measurement. The water elevation in the Oxnard aquifer key Well No. 01N21W07H01S was up 9.5 feet. The water elevation in the Oxnard Plain Fox Canyon aquifer key Well No. 01N21W32K01S was at the same levels as the 2011 measurement.

In the Pleasant Valley Fox Canyon aquifer the water level elevation in key Well No. 01N21W03C01S was up 10.4 feet from the 2011 measurement. The water level had been down 4.9 feet from the 2010 measurement.

In the Las Posas valley, the water level elevation in the West Las Posas basin key Well No. 02N21W12H01S was down 4.6 feet from the 2011 spring measurement. In the East Las Posas basin the water level elevation in key Well No. 03N20W26R03S was up 13.5 feet. The water levels in this well had been declining over the past three spring measurements and over the previous ten year period, with the exception of 2003 and 2007. The water level elevation in the South Las Posas key Well No. 02N19W05K01S continued its slight upward trend of the past several years but was down slightly 1.5 feet in 2012. The depth to water in this well has risen from 136 feet to 27 feet below ground surface since 1975. This trend is attributed to groundwater recharge from treated effluent from upstream waste water treatment plants and groundwater discharge to surface from the Simi Valley basin.

In the Santa Rosa Valley the water level elevation in key Well No. 02N20W26B03S was up 0.5 foot from the 2011 measurement. The water level elevation in the Simi Valley Basin key Well No. 02N18W10A02S was up 4.0 feet from the 2011 measurement. This well has seen only slight changes in depth over the past eight years (less than plus or minus 10 feet).

In the Ojai Valley, the water level elevation in key Well No. 04N22W05L08S was down 3.3 feet from the 2011 measurement after having recovered the previous two springs from the 31.1 foot decline in 2009. The Ojai Valley basin responds quickly to rainfall or the lack of rainfall, and it is not uncommon to see large drops in water level during dry periods and recovery to at or above normal levels during wet periods (see Hydrograph in Appendix B). In the northern end of the Upper Ventura River Basin, the water level elevation in key Well No. 04N23W16C04S was down 21.7 feet from the measurement in 2011.

The basins that underlie the Santa Clara River valley are other areas that respond quickly to fluctuations in annual rainfall. The water level elevation in the Piru basin key well was down 6.3 feet in 2012 after being up 4.6 feet in 2011. The water level elevation in the Fillmore basin key well was down 6.7 feet after being up 8.7 feet the previous spring, and in the Santa Paula basin the water level elevation in the key well was down 7.4 feet after being up 6.1 feet over the 2011 measurement. In the Mound basin the water level elevation in key Well No. 02N22W07M02S was up slightly 1.9 feet from the 2011 spring measurement.

In the north half of the County the Lockwood Valley basin key Well No. 08N21W35B01S was unable to be measured in the spring of 2012. In the Cuyama Valley basin key Well No. 07N23W16R01S was down 3.6 feet after being up 5.7 feet for the 2011 measurement.

4.1.5 – Groundwater Extractions

Groundwater is extracted and used for domestic, municipal and industrial uses, the majority of groundwater extracted (≈ 60%) in the County is used for agricultural irrigation purposes. Based on measured data from the FCGMA and extrapolating the data to the county as a whole where no data exists. The FCGMA reports that approximately 60% of groundwater is extracted for agricultural purposes with the remaining 40% for municipal, industrial and domestic uses. The owners and operators of wells within the boundaries of any of the three Groundwater Management Agencies, Fox Canyon Groundwater Management Agency, Ojai Basin Groundwater Management Agency and United Water Conservation District, are required to report their groundwater extractions twice each year to the respective agency. Approximately 2,000 of the 3,500 plus active wells in the County are within one or more of these agency boundaries. Owners of wells located outside of these agencies are not required to report their extractions but are asked to report the status of their well to the County each year. The table at the top of the following page compares extractions reported to the three agencies for the years 2005 to 2012. Note: the boundaries of the FCGMA and UWCD overlap.

Table 4-1: Groundwater extractions within reporting agencies 2005-2012[3,1,2]

	Agency		
Reported Extractions (AF)	UWCD	FCGMA	OBGMA
2005-1	58,045.00	41,811.56	1,748.07
2005-2	95,174.00	64,578.80	2,880.39
Annual Total 2005	**153,219.00**	**106,390.35**	**4,628.46**
2006-1	65,469.00	43,697.47	1,722.17
2006-2	101,684.00	69,827.60	2,234.77
Annual Total 2006	**167,153.00**	**113,525.07**	**3,956.94**
2007-1	90,701.00	59,449.79	2,708.68
2007-2	108,289.70	77,642.73	2,759.06
Annual Total 2007	**198,990.70**	**137,092.52**	**5,467.74**
2008-1	90,997.65	63,821.98	2,650.38
2008-2	102106.68	75,467.27	2,590.30
Annual Total 2008	**193,104.33**	**139,289.25**	**5,240.68**
2009-1	82,505.37	62,497.79	2,553.48
2009-2	104,049.64	81,274.51	2,871.94
Annual Total 2009	**186,555.01**	**143,772.30**	**5,425.42**
2010-1	69,541.85	52,696.43	2,004.86
2010-2	89,558.90	68,875.72	3,001.11
Annual Total 2010	**159,100.75**	**121,572.15**	**5,005.97**
2011-1	72,940.07	52,422.24	2,050.00
2011-2	86,560.99	62,933.95	3,099.00
Annual Total 2011	**159,501.06**	**115,356.19**	**5,149.00**
2012-1	78,414.49	69,678.79	2,795.00
2012-2*	Not Yet Reported	53,000	Not Yet Reported
Annual Total 2012		**122,678.79**	

*FCGMA 2012-2 extraction value is preliminary and is subject to change.

4.2 – Surface and Imported Water

The following subsections focus on water supplied and imported by the three wholesale water districts in the County: United Water Conservation District (UWCD), Casitas Municipal Water District (Casitas) and Calleguas Municipal Water District (Calleguas).

Figure 4-4: Map of the boundaries of the three wholesale water districts within the County.

[1] Data courtesy of FCGMA.
[2] Data courtesy of OBGMA.

4.2.1 – Surface & Imported Water Background

Of the ten incorporated cities within Ventura County only two, Santa Paula and Fillmore do not rely on water supplied by one of the three major wholesale districts (Casitas Municipal Water District, Calleguas Municipal Water District and United Water Conservation District).

Two cities (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 from Lake Casitas delivered by Casitas MWD. The City of Oxnard receives water from UWCD, imported water from Calleguas and groundwater from City well fields.

In the south 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, Ventura County Water Works District 8 (VCWWD8), extracts groundwater currently used for agricultural purposes, from three wells in the Tapo Canyon area. Also, groundwater is extracted from several wells at the west end of the city for de-watering purposes. The water from these wells is discharged to the Arroyo Simi. The City is currently nearing completion of the Tapo Canyon Water Treatment Plant, a 1 MGD treatment plant, which will utilize the three Tapo Canyon wells to provide water to approximately 500 homes. Golden State Water Company (GSWC) in Simi Valley extracts groundwater from two wells and blends it with imported water from Calleguas (10% groundwater, 90% imported water)[3]. VCWWD8 serves 68% of demand or over 23,000 AF of water while GSWC serves the remaining 32%, approximately 8,500 AF[4]. In 2012 Calleguas delivered 21,613.1[6] AF to VCWWD8 and 6,875.2[6] AF to GSWC.

The City of Moorpark residents receive water from Ventura County Water Works District 1 (VCWWD1). Approximately 75-80% of VCWWD1's water is imported from Calleguas. In 2012 Calleguas delivered 8,524.0[6] 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 2010 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 2012 these three water purveyors received 36,522.4[6] 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 Fox Canyon Groundwater Management Agency. In 2012 Calleguas delivered 5,463.1[6] 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).

[3] Golden State Water Company, 2010 Urban Water Management Plan – Simi Valley.
[4] Ventura County Waterworks District No. 8, City of Simi Valley, 2010 Urban Water Management Plan.

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.

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 the 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)[5] 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 the 32 groundwater basins, or from fractured volcanic rock and bedrock in areas outside of groundwater basins.

4.2.2 – Wholesale Districts

Of the three water wholesalers in the County, Calleguas delivers the largest volume of water to retailers. Approximately 75% of the population in the County receives water imported by Calleguas. Calleguas, a member agency of the Metropolitan Water District (MWD), imports State Water Project (SWP) water from northern California. Calleguas delivered 104,104[6] AF of water to retailers in 2012 compared to 97,218[6] AF in 2011 and 94,864[6] AF in 2010. The Calleguas Municipal Water District imported a total of 106,314[6] AF of treated SWP water in 2012. Production from the District's ASR wellfield was 4,064.8 AF in 2012. 6,547.9[6] AF of water was injected in 2012 in the ASR wellfield. Up to 11,000 AF of water can be stored by Calleguas in Lake Bard and can supply all of the District's needs for short periods of time. The end of year volume of water in storage in Lake Bard was 10,080[6] AF. Some imported water is also injected in the East Las Posas groundwater basin through the Las Posas Aquifer Storage and Recovery (ASR) Project. The Las Posas Basin 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 32,638[4] AF of water to retailers and end-users in 2012 up slightly from 31,868[4] AF in 2011. UWCD can store up to 87,000 AF of water in Lake Piru. At the end of 2012 there was 20,294[4] AF of water in storage in Lake Piru. UWCD released 30,183[4] *(preliminary data)* AF of water from the lake in 2012. UWCD imported 3,150[4] AF of State Project water into Ventura County from Lake Pyramid in 2012. 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 Forebay Groundwater Basin for the purpose of groundwater recharge. Some of the water diverted from the Santa Clara River at the Freeman diversion is sent to the spreading basins in Saticoy and El Rio, the remainder is sent through the Pleasant Valley Pipeline (PVP) and the Pumping Trough Pipeline (PTP). Table 4-2 and Figure 4-3 on the following page compare the volume of water diverted and sent to spreading grounds by UWCD versus annual precipitation for the period of 1995 to 2012.

[5] Data from City of Santa Paula 2010 Urban Water Management Plan

Table 4-2: Comparison of precipitation versus recharge water volume for UWCD[4].

Year	Precipitation El Rio Spreading Grounds Gage 239(in.)	Saticoy Recharge (AF)	El Rio Recharge (AF)	Noble Pit (AF)
1995	27.27	35419.44	52876.00	10657.00
1996	20.25	25608.38	24633.00	3806.00
1997	13.3	22323.03	25271.00	4412.00
1998	30.88	56934.95	43027.00	18710.00
1999	9.39	16538.51	17992.00	1285.00
2000	15.59	28620.11	23173.00	0.00
2001	22.4	26918.00	39434.00	8824.00
2002	8.97	5291.00	14886.00	32.00
2003	14.79	7158.00	26909.00	44.00
2004	16.13	8105.00	15061.00	0.00
2005	24.43	46872.00	52267.00	19490.00
2006	15.29	29005.00	40840.00	10709.00
2007	7.77	11404.00	18200.00	99.00
2008	14.07	28,631.00	19,631.00	8,562.00
2009	10.86	9,215	13,223	0.00
2010	22.07	15,108	30,125	995.00
2011	10.95	23,435.00	37,845.00	10,679.00
2012	10.25	3,985.00	16,293.00	538.00

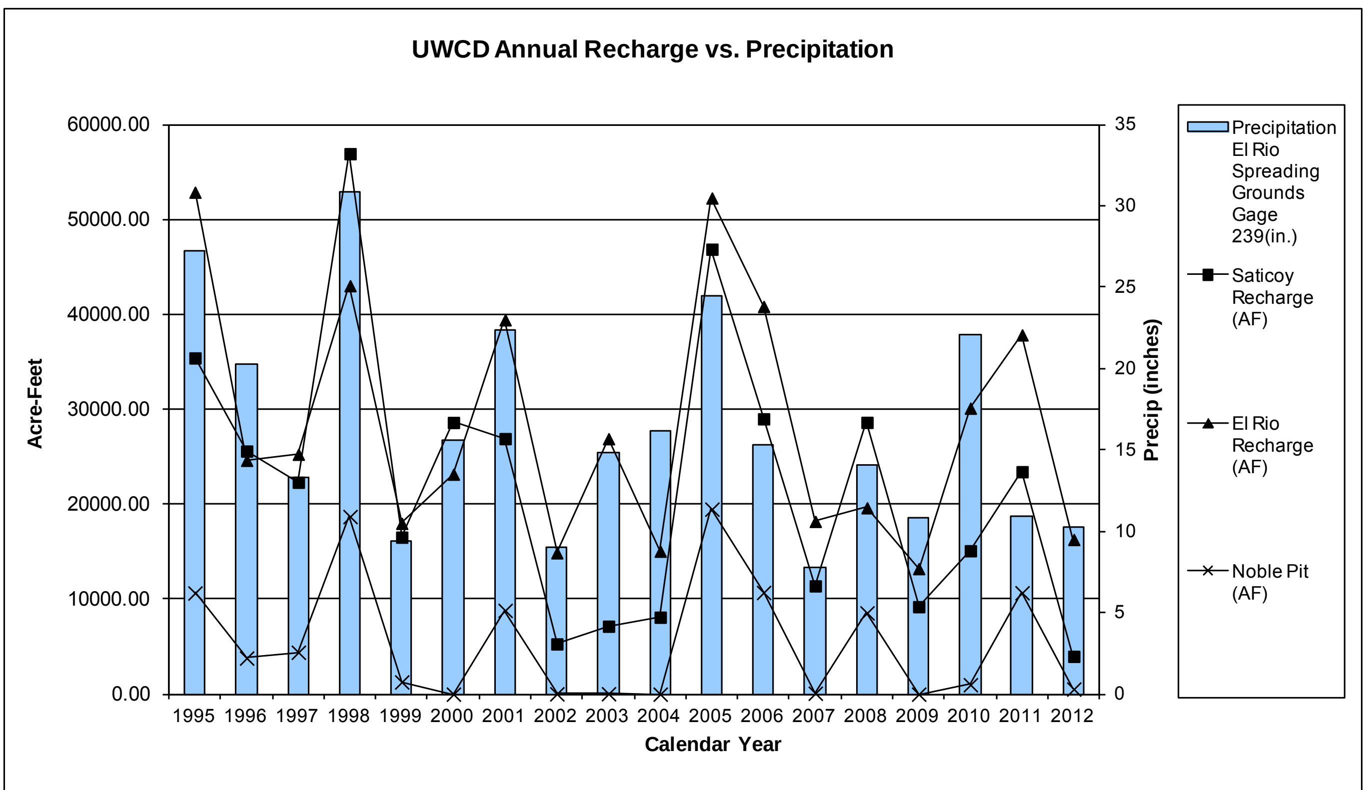


Figure 4-5: Graph depicting precipitation versus recharge for UWCD[4].

The Casitas Municipal Water District delivered 15,269[5] AF in 2012, with approximately 5,000[5] 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 13,000 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 254,000 AF. At the end of 2011 there was 183,134[5] AF of water 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[5] 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.

Table 4-3 below compares the volume of water delivered by the three major water districts in the County for the period of 2005 to 2012.

Table 4-3: Comparison of Wholesale District water deliveries 2005-2012.

	Water Deliveries in Acre Feet (AF)			
Year	**Casitas MWD**	**Calleguas MWD**	**United WCD**	**Annual Total**
2005	16,526.50	116,431.80	30,271.46	163,229.76
2006	15,873.80	120,736.30	30,627.87	167,237.97
2007	20,080.90	131,206.10	41,387.64	192,674.64
2008	16,497.70	125,367.50	39,903.80	181,769.00
2009	15,736.10	108,726.00	41,478.00	165,940.10
2010	13,497.48	94,863.70	34,075.80	142,436.98
2011	13,439.25	97,218.00	31,868.00	142,525.25
2012	15,268.49	104,104.00	32,638.00	152,010.49
Period Total	**126,920.22**	**794,549.40**	**282,250.57**	**1,155,813.70**

Section 5.0
Groundwater Potentiometric Surface Maps

5.1 – Mapping

Contour maps are a useful way to visualize spatial distribution of data values. ESRI's ArcMap GIS software was used to generate the contours in the report. Because the contour lines are the end result of a series of code based mathematical calculations the resulting lines should be considered only as an interpretation of the conditions in the area mapped. Contour lines drawn by the software were adjusted manually by staff in some cases to better reflect expected edge of basin conditions.

5.1.1 –Maps

The 2011 Groundwater Section Annual Report contained a series of three different potentiometric surface maps covering: a) The Santa Clara River Valley, which includes the Piru Basin, Fillmore Basin, Santa Paula Basin, and the Mound Basin; b) The Oxnard Plain, Oxnard Forebay, and Pleasant Valley Basin; and c) the Oxnard Plain, Oxnard Forebay, Pleasant Valley, and the West, East and South Las Posas Basins. One drawback to grouping them this way is that it separated the Mound and Santa Paula Basin on one map, from the Oxnard Plain and Forebay Basin on another map, possibly giving the impression that there may not be flow between the basins.

This year the potentiometric surface maps for the basins were organized in a different manner. The following pages contain a series of two different potentiometric surface maps created from 2012 groundwater level data for the a) Santa Clara River Valley and the upper aquifer system of the Oxnard Plain and Pleasant Valley, and b) the lower aquifer system of the Oxnard Plain, Pleasant Valley, and Las Posas Valley Basins. Following a review of information regarding the Mound Basin boundaries contained in United Water Conservation District's open File Report 2012-01 and DWR Bulletin 118, it appears that the existing mapped boundaries may not in fact be barriers to groundwater flow. We have decided to continue potentiometric surface lines across the southern mapped Mound Basin boundary for the upper and lower system, and across the Santa Paula/Mound Basin Boundary for the upper system in this report. Doing so still demonstrates the boundary condition at the Santa Paula Basin and Mound Basin boundary, while providing information about water levels in the Oxnard Plain and Mound Basin on the same map.

Figures 5-1 thru 5-2 on pages 77-78 are potentiometric surface maps for 2012 for the Santa Clara River Valley area encompassing the Mound, Santa Paula, Fillmore, and Piru groundwater basins. The maps also include the upper aquifer system of the Oxnard Plain and Pleasant Valley area. The contours were created using data collected by County staff, United Water Conservation District staff, and the staff of other agencies, cities and water companies. For this exercise the basin area was truncated to include only the extent of the alluvial area of the valley, instead of using the full area of the basin as depicted by the groundwater basin lines on the maps. Note that the Forebay area has no confining clay cap as there is overlying the Oxnard Plain Pressure Basin, therefore the Oxnard aquifer is not recognized as being present here. In the Pleasant Valley area the upper aquifer system 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. No well data from the perched or semi-perched zone of the Oxnard Plain was used to generate these contours, and some water levels represent confined conditions.

Figures 5-3 thru 5-4 on pages 79-80 are 2012 groundwater potentiometric surface maps for the lower aquifer system of the Mound basin, Oxnard Plain and Las Posas Valley area. In previous reports we have used the Moorpark anticline as a boundary between the East and South Las Posas Basins to map potentiometric surface maps. DWR Bulletin 118 does not divide the Las Posas Basin, but maps it as one large basin. That plus additional reports, indicate there may not be a significant groundwater flow barrier in that location. In this report the potentiometric surface is mapped to reflect no barrier to flow between the East Las Posas Basin and the South Las Posas Basin. Data points for wells perforated in the shallow sand and gravel zones of the Las Posas Valley were not used to generate these contours.

The Groundwater Section welcomes comments and suggestions concerning the potentiometric surface maps presented on the following pages or the report in general. Please contact Jeff Dorrington at jeff.dorrington@ventura.org

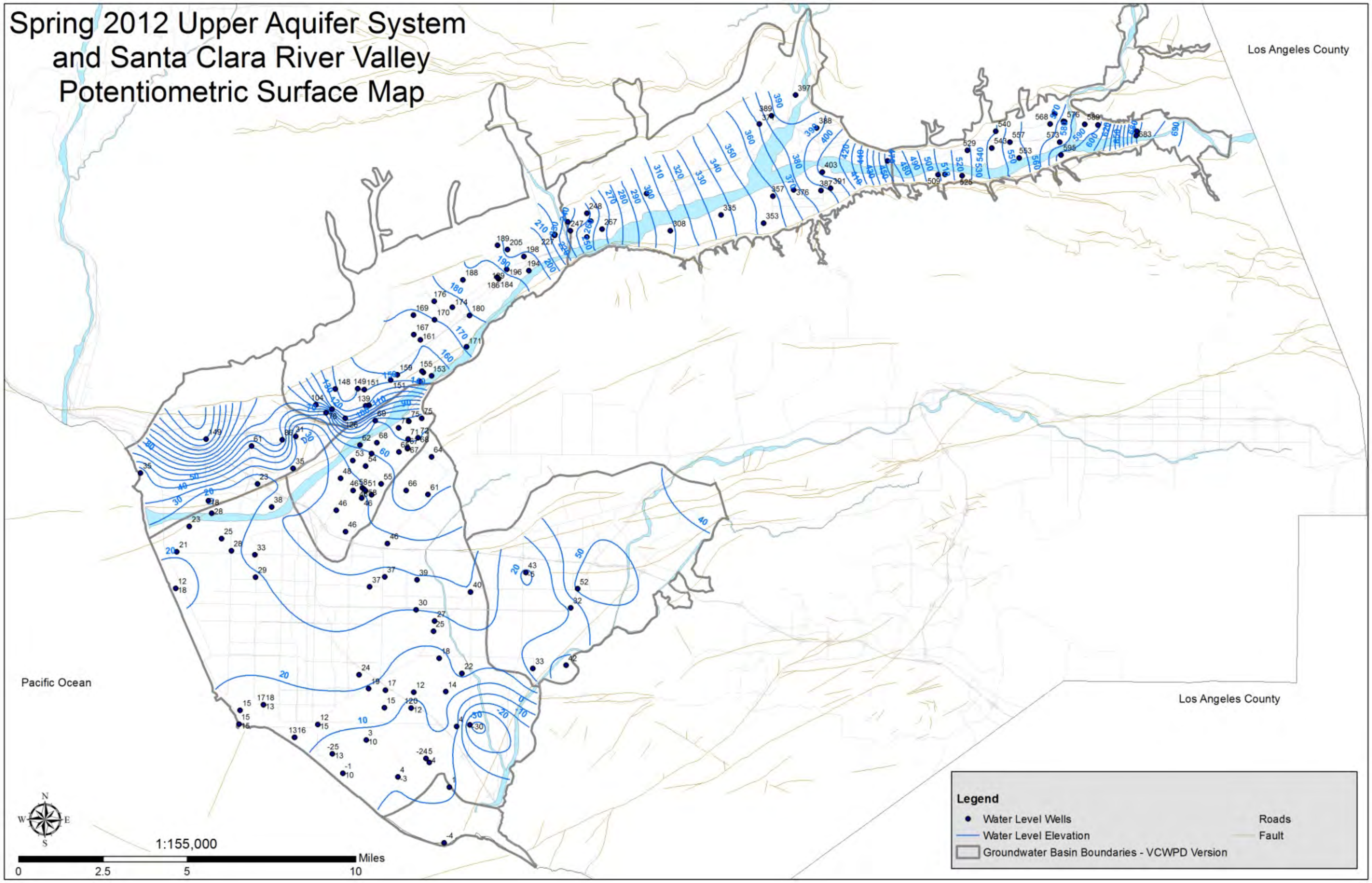


Figure 5-1: The map above depicts water level surface elevation contours for the Santa Clara River Valley area and the Upper Aquifer System for Spring 2012.

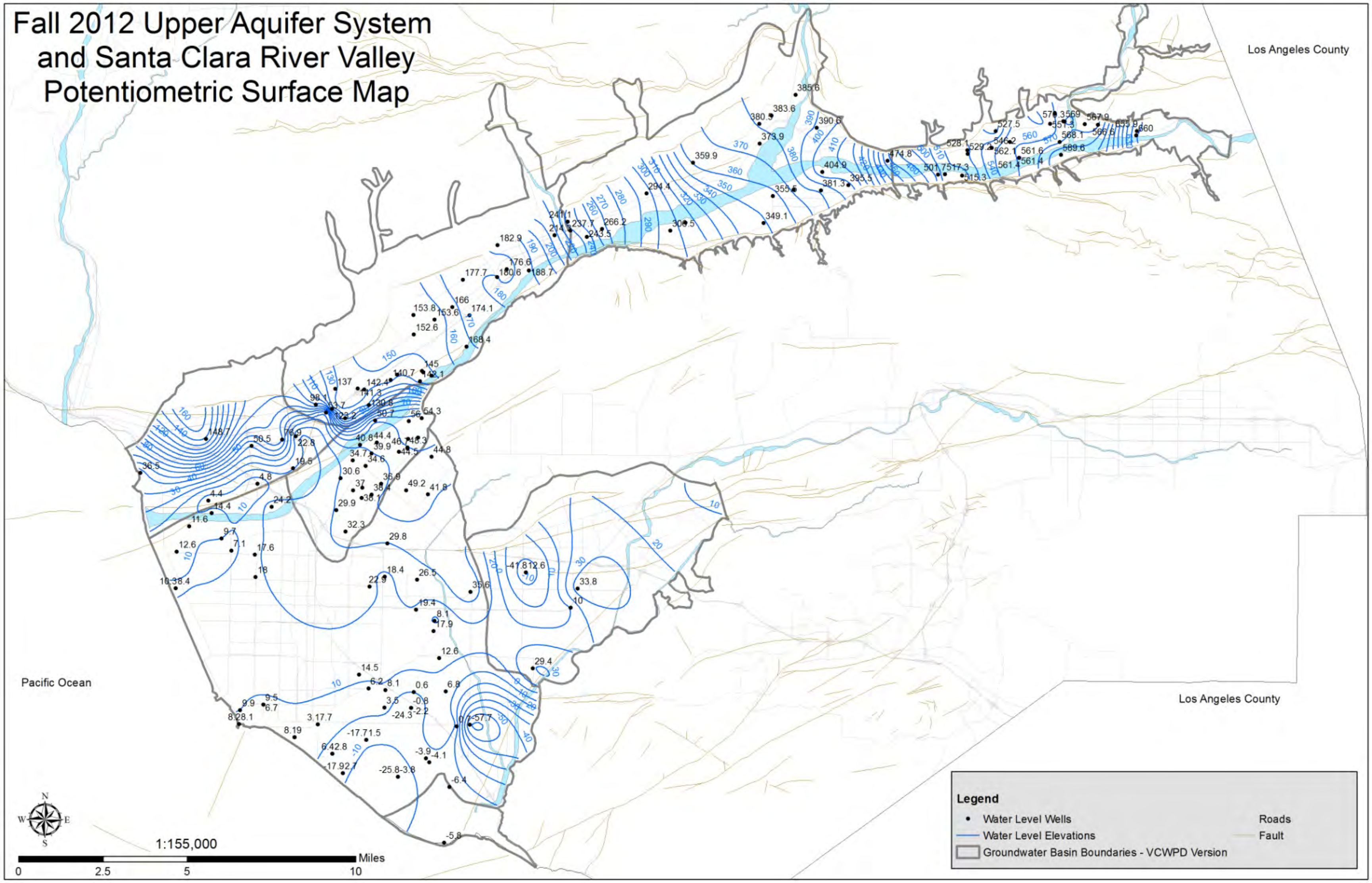


Figure 5-2: The map above depicts water level surface elevation contours for the Santa Clara River Valley area and the Upper Aquifer System for Fall 2012.

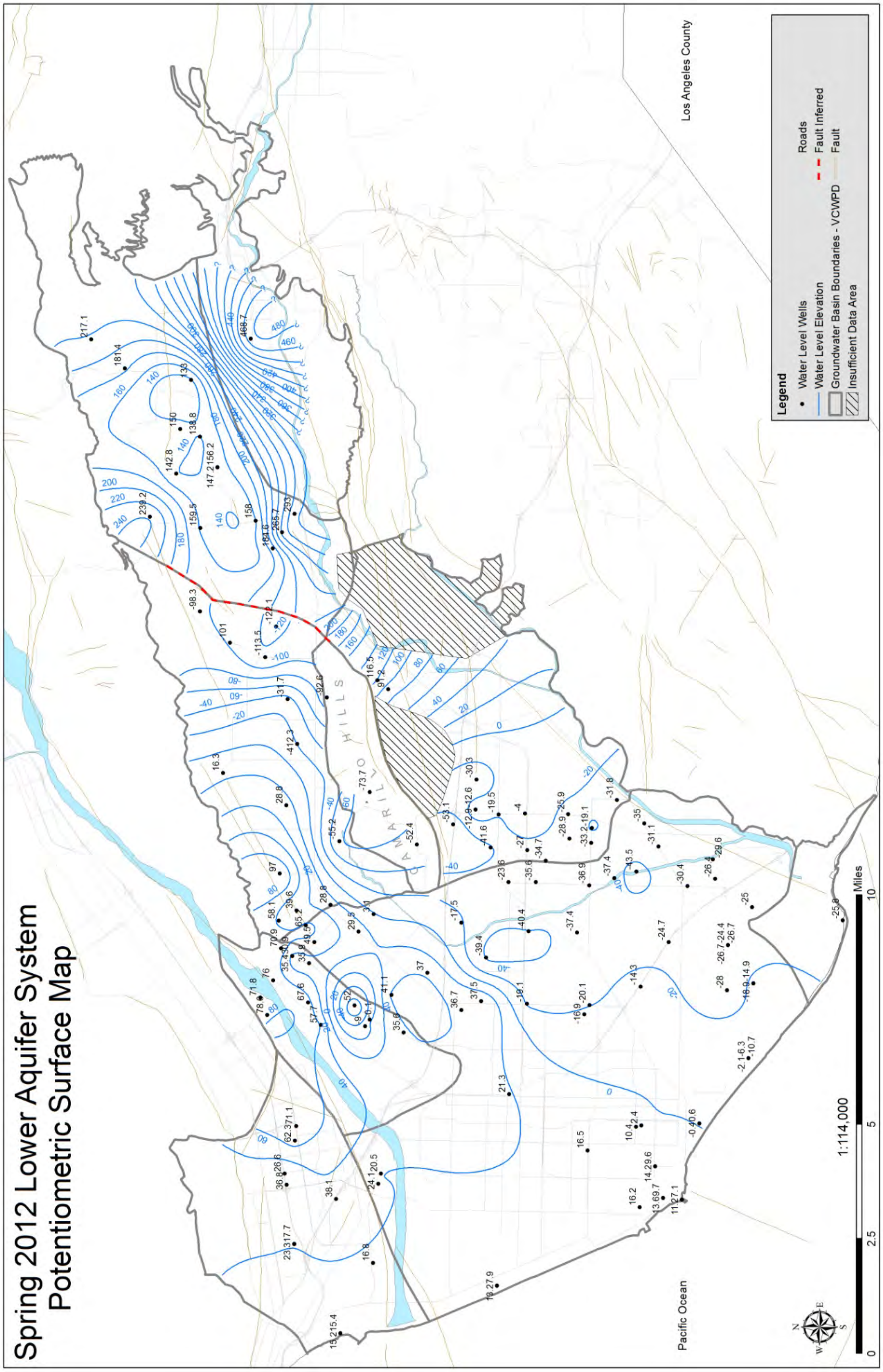


Figure 5-3: The map above depicts water level surface elevation contours for the Lower Aquifer System for Spring 2012.

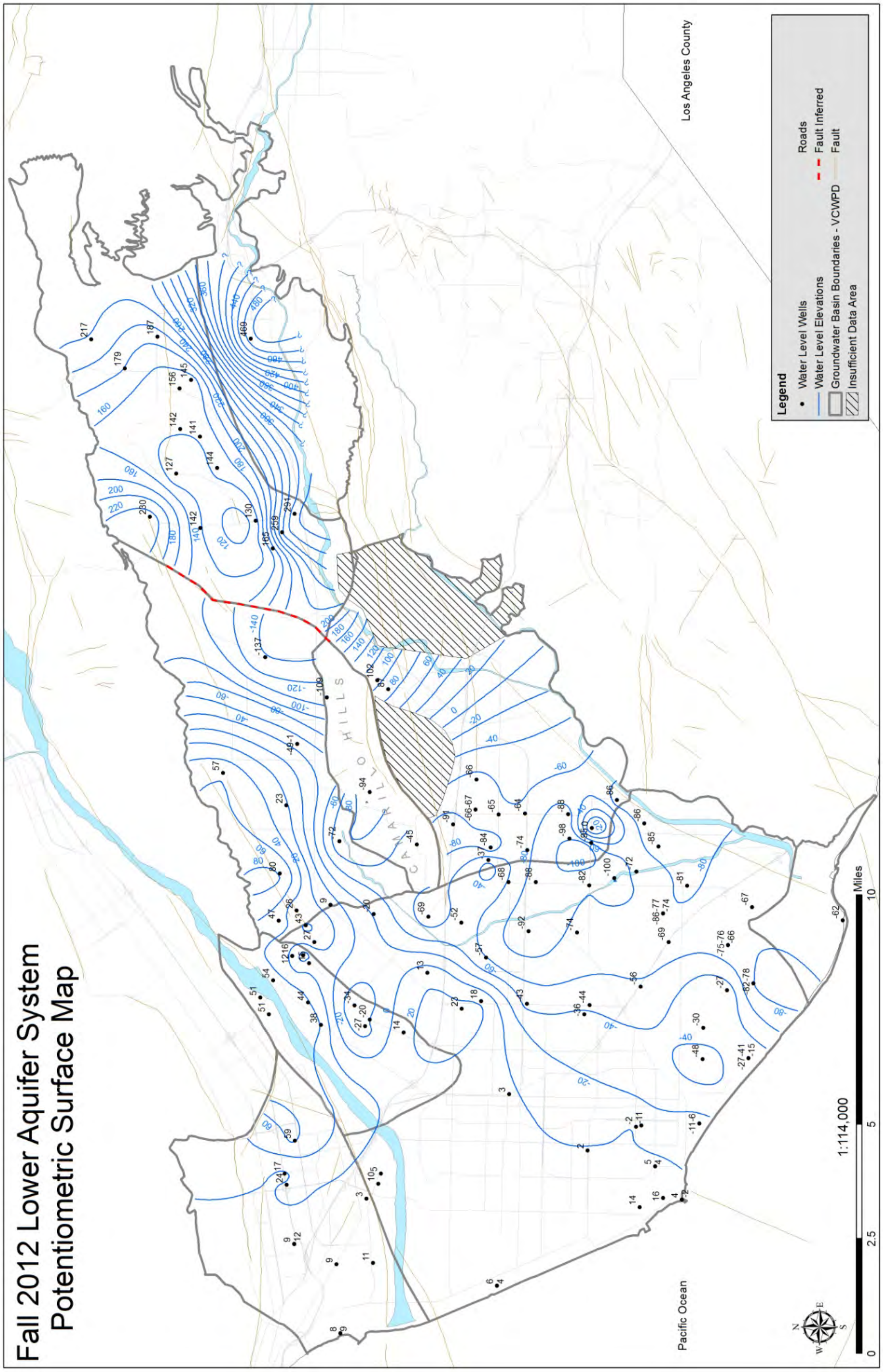


Figure 5-4: The map above depicts water level surface elevation contours for the Lower Aquifer System area for Fall 2012.

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(Footnotes)

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11 - City of Santa Paula 2010 Urban Water Management Plan Update, Ventura County, California, June 2011, Miller-Villa Consulting

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.

Appendix A – Glossary of Groundwater Terms

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. 4184: 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 and most recently in May 1999. The purpose of the ordinance is to ensure that all new or modified water wells, cathodic protection wells 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 Wells

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Appendix B – Key Water Level Wells

Key water levels for the most significant groundwater basins are depicted in chart or graph form on the following pages to provide visual representations of groundwater conditions as they existed during and at the date or time of measurement.

Note that the time durations of the graphs may cover varying lengths of time, however the main goal is to provide a quick reference view of water levels and/or changes for specific aquifers or groundwater basins for the longest or best available time interval.

Each of the following pages is organized to describe the set of key water level wells measured by staff every other month. Each well listed includes a line graph (hydrograph) of groundwater levels measured periodically in relation to the ground surface or some specific reference point (RP) which is usually the top of the well casing or the concrete slab at the wellhead (RP may be above or below the existing ground surface). The hydrographs are accompanied by an up-down graph to track trends in well levels.

The following summary sheet for 2012 is used by Groundwater Section Staff to track long-term trends and to monitor the average groundwater supplies (volume) in storage. Spring season measurements are used for comparison since this time period is typically at the end of the seasonal and annual rainfall year when groundwater basins should be at their fullest. Resource management strategies are judged and adjusted based on groundwater basin levels measured at these key wells, so they have value both for planning and evaluation in water supply and demand decisions. A quick glance at the 2012 key well table list shows that many of the historical high groundwater levels occurred in the wet (high rainfall) years of 1983, 1993 or 1998. Historical low water levels were mainly reflected in dry (low rainfall) years of 1990-1991 most recently, however the drought records from the early 1960's remain unbroken when groundwater levels were at their lowest.

Key wells were/are selected as representative data points based on a centralized location within any particular groundwater basin, a sufficient penetration (depth) or perforation interval within the target aquifer, proper structural or sanitary seals, adequate well construction and site access, and potential for long-term use (measurement).

These data are static water level measurements.

Appendix B – Key Water Level Wells

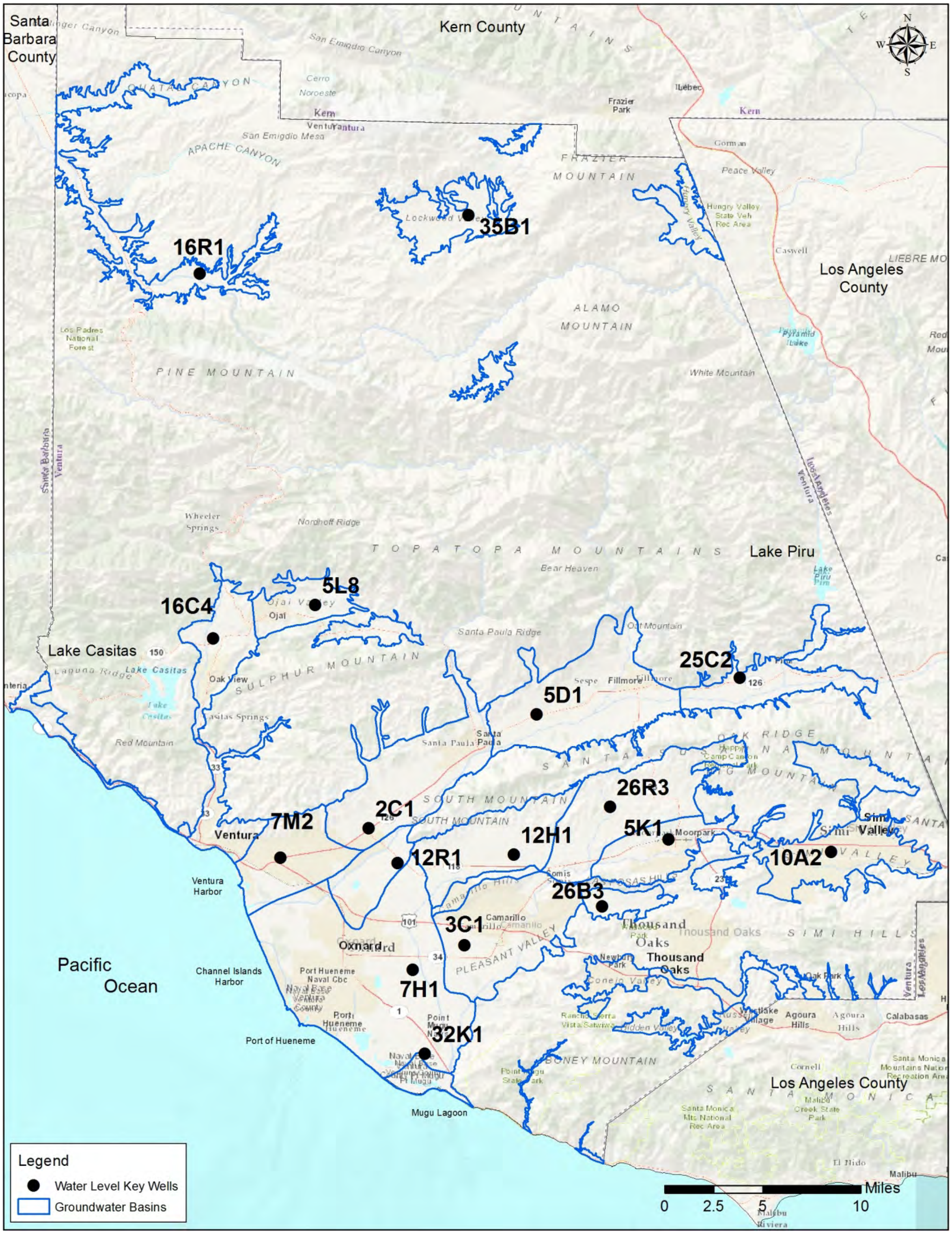

Figure B-1: Map showing key water level wells in Ventura County.

<u>Appendix B</u>– Key Water Level Wells

DEPTH TO GROUND WATER LEVEL CHANGES
AT KEY WELLS IN VENTURA COUNTY

		HISTORIC		SPRING					
BASIN	WELL NUMBER	RECORD HIGH	RECORD LOW	WATER LEVEL	WATER LEVEL	WATER LEVEL	Change From Previous Year	10 Year Average Spring Water Level	Change From Previous 10 Year Spring Average
	(RECORD)	(DATE)	(DATE)	(YEAR 2010)	(YEAR 2011)	(YEAR 2012)	(UP/DOWN)	2001-2010	(UP/DOWN)
OXNARD PLAIN									
Oxnard Aquifer	01N21W07H01S	3.4 ft.	88.4 ft.	28.6 ft.	19.1 ft.	16.3 ft.	UP 2.8 ft.	20.4 ft.	UP 4.1 ft.
	(1/31-present)	(3/99)	(9/64)	(3/29)	(3/14)	(3/6)			
Forebay Area	02N22W12R01S	14.6 ft.	136.8 ft.	56.4 ft.	36.3 ft.	66.8 ft.	DOWN 30.5 ft.	48.9 ft.	DOWN 18.3 ft.
(UWCD)	(5/31-present)	(6/98)	(2/91)	(3/2)	(4/5)	(3/29)			
Fox Canyon	01N21W32K01S	18.0 ft.	129.0 ft.	34.0 ft.	35.0 ft.	35.0 ft.	NO CHANGE	37.9 ft.	UP 2.9 ft.
Aquifer	(12/72-present)	(4/83)	(12/90)	(3/29)	(3/21)	(3/5)			
PLEASANT VALLEY									
Fox Canyon	01N21W03C01S	87.5 ft.	253.9 ft.	97.3 ft.	102.2 ft.	91.8 ft.	UP 10.4 ft.	105.0 ft.	UP 13.2 ft.
Aquifer	(2/73-present)	(8/95)	(11/91)	(3/26)	(3/14)	(3/7)			
WEST LAS POSAS	02N21W12H01S	422.2 ft.	501.8 ft.	444 ft.	445.0	449.6 ft.	DOWN 4.6 ft.	455.4 ft.	UP 5.8 ft.
	(10/72-present)	(3/75)	(12/91)	(4/9)	(3/7)	(3/21)			
EAST LAS POSAS	03N20W26R03S	503.0 ft.	619.3 ft.	585.8 ft.	588.5 ft.	575 ft.	UP 13.5 ft.	546.8 ft.	DOWN 28.2 ft.
	(1985-present)	(4/86)	(9/09)	(3/26)	(3/7)	(3/28)			
SOUTH LAS POSAS	02N19W05K01S	27.5 ft.	136.2 ft.	28.3 ft.	30.6 ft.	29.1 ft.	UP 1.5 ft.	30.8 ft.	UP 1.7 ft.
	(6/75-present)	(7/06)	(6/75)	(3/24)	(3/7)	(3/21)			
SANTA ROSA	02N20W26B03S	13.2 ft.	60.3 ft.	30.6 ft.	29.0 ft.	28.5 ft.	UP 0.5 ft.	30.2 ft.	UP 1.7 ft.
VALLEY	(10/72-present)	(4/79)	(11/04)	(3/26)	(3/11)	(3/8)			
SIMI VALLEY	02N18W10A02S	45.0 ft.	92.0 ft.	76.9 ft.	75.6 ft.	71.6 ft.	UP 4.0 ft.	77.4 ft.	UP 5.8 ft.
	(12/84-present)	(2/98)	(6/92)	(3/26)	(3/11)	(3/8)			
VENTURA RIVER	04N23W16C04S	3.9 ft.	101.0 ft.	22.1 ft.	23.0 ft.	44.7 ft.	DOWN 21.7 ft.	29.3 ft.	DOWN 15.3 ft.
	(7/49-present)	(3/83)	(2/91)	(4/2)	(3/8)	(3/13)			
OJAI VALLEY	04N22W05L08S	38.2 ft.	312.0 ft.	121.6 ft.	94.3 ft.	97.6 ft.	DOWN 3.3 ft.	117.3 ft.	UP 19.7 ft.
	(10/49-present)	(4/78)	(9/51)	(4/6)	(6/23)	(3/15)			
MOUND	02N22W07M02S	126.6 ft.	176.2 ft.	148.6 ft.	148.3 ft.	146.4 ft.	UP 1.9 ft.	149.1 ft.	UP 4.3 ft.
	(4/96-present)	(4/98)	(4/96)	(4/6)	(4/6)	(4/4)			
SANTA PAULA	02N22W02C01S	20.7 ft.	51.9 ft.	33.8 ft.	27.7 ft.	35.1 ft.	DOWN 7.4 ft.	32.8 ft.	DOWN 2.3 ft.
	(10/72-present)	(4/83)	(12/91)	(3/31)	(3/29)	(3/5)			
FILLMORE	03N20W05D01S	107.8 ft.	163.7 ft.	136.2 ft.	127.5 ft.	134.2 ft.	DOWN 6.7 ft.	129.9 ft.	DOWN 4.3 ft.
	(10/72-present)	(2/79)	(12/77)	(3/31)	(3/9)	(3/5)			
PIRU	04N19W25C02S	43.1 ft.	183.2 ft.	69.5 ft.	64.9 ft.	71.2 ft.	DOWN 6.3 ft.	67.4 ft.	DOWN 3.9 ft.
	(9/61-present)	(3/93)	(10/65)	(4/7)	(3/9)	(3/5)			
LOCKWOOD VALLEY	08N21W35B01S	19.3 ft.	52.9 ft.	19.3 ft.	46.8 ft.	No Reading		No Reading	No Reading
	(6/56-present)	(05/10)	(10/91)	(5/18)	(6/23)				
CUYAMA VALLEY	07N23W16R01S	15.0 ft.	47.5 ft.	34.6 ft.	28.9 ft.	32.5 ft.	DOWN 3.6 ft.	29.5 ft.	DOWN 2.9 ft.
	(3/72-present)	(4/93)	(9/90)	(5/18)	(6/23)	(4/19)			

<u>Table B-1</u>: Key Well Water Level Changes for 2012.

Appendix B – Key Water Level Wells

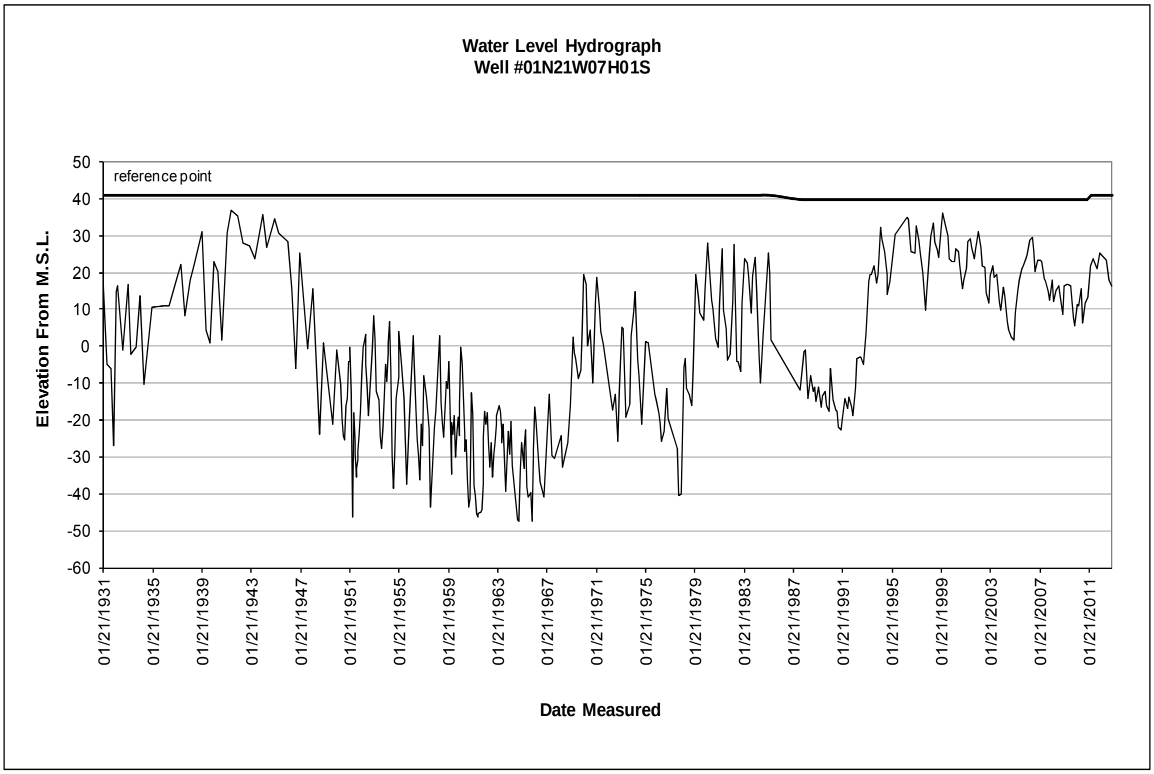

Figure B-2: Oxnard aquifer key well Hydrograph.

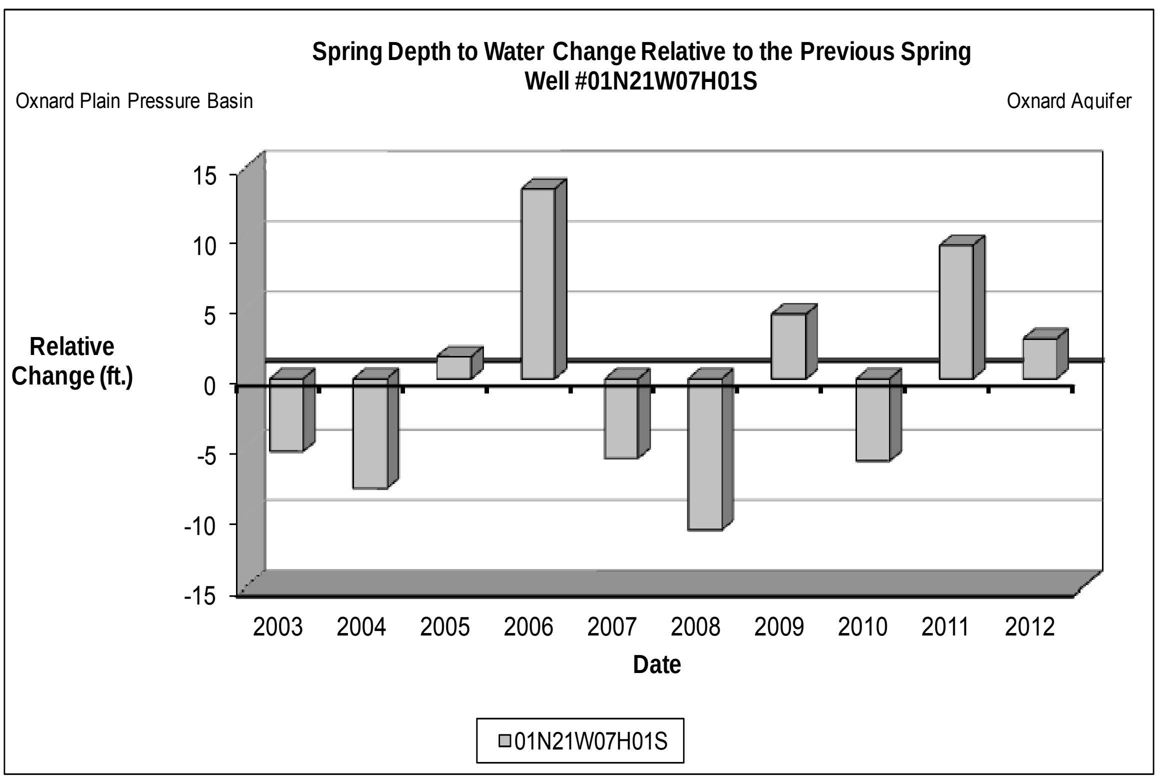

Figure B-3: Oxnard aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

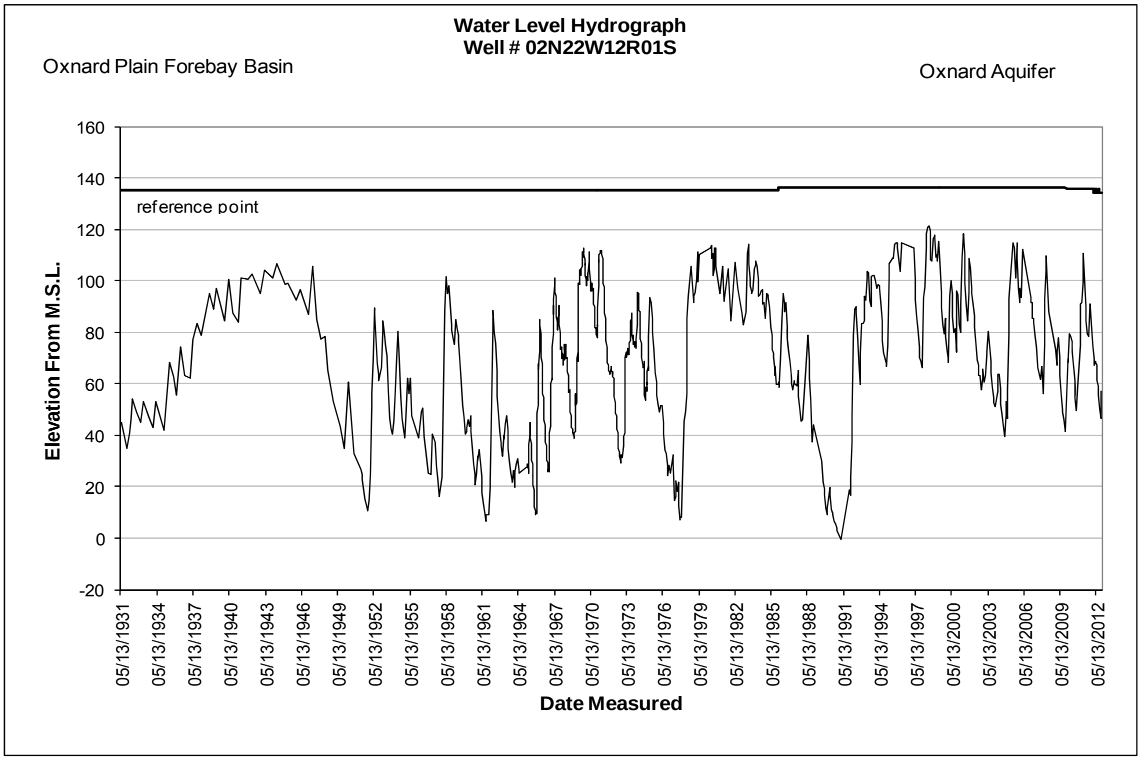

Figure B-4: Forebay area key well Hydrograph.

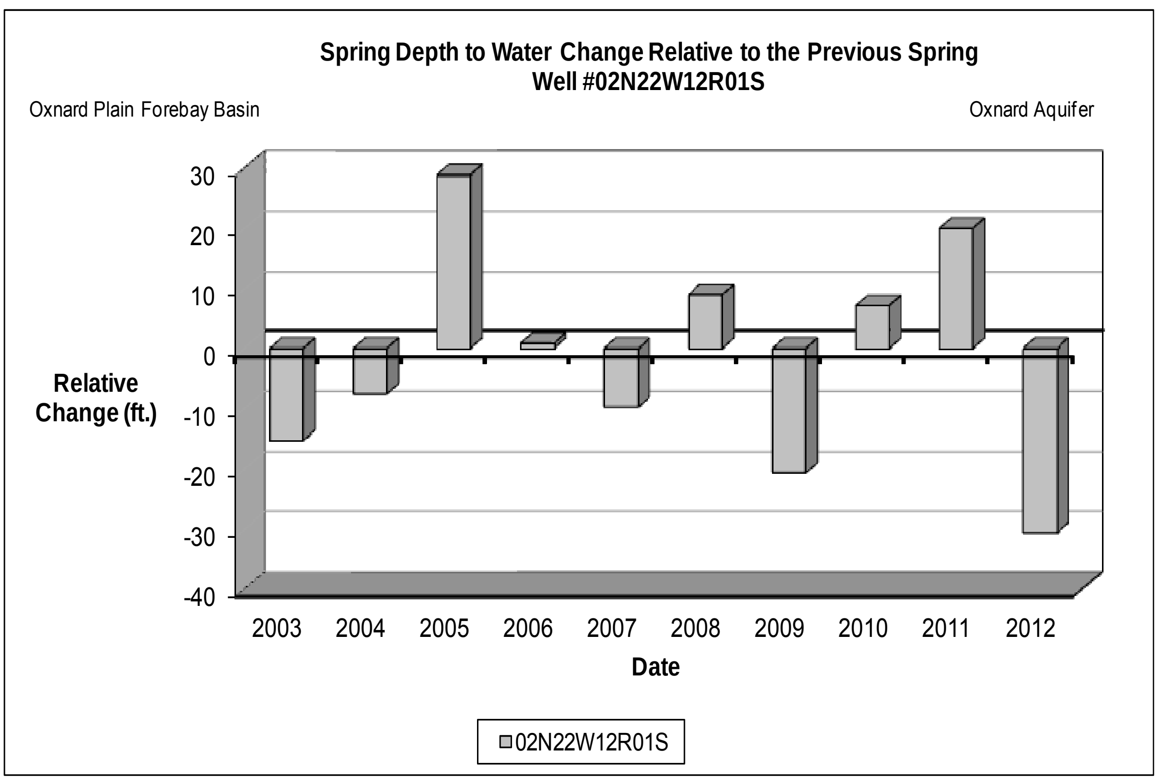

Figure B-5: Forebay Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

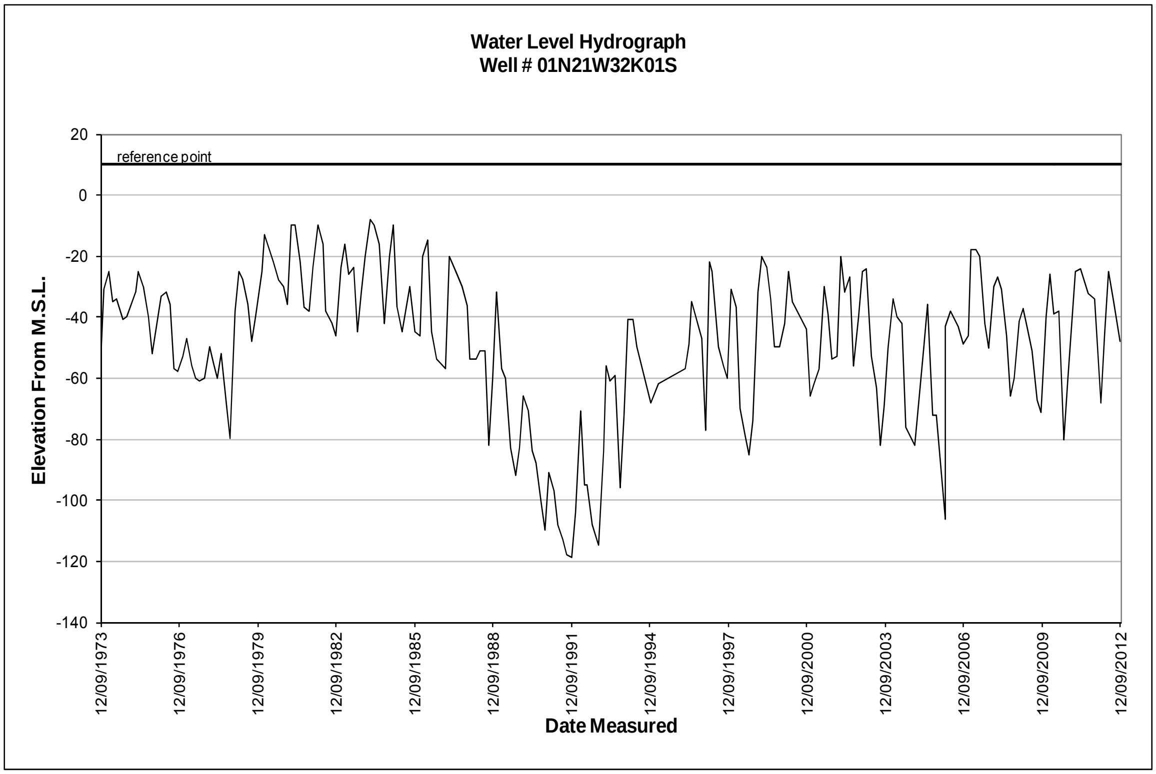

Figure B-6: Forebay Basin Fox Canyon Aquifer Key Well Hydrograph.

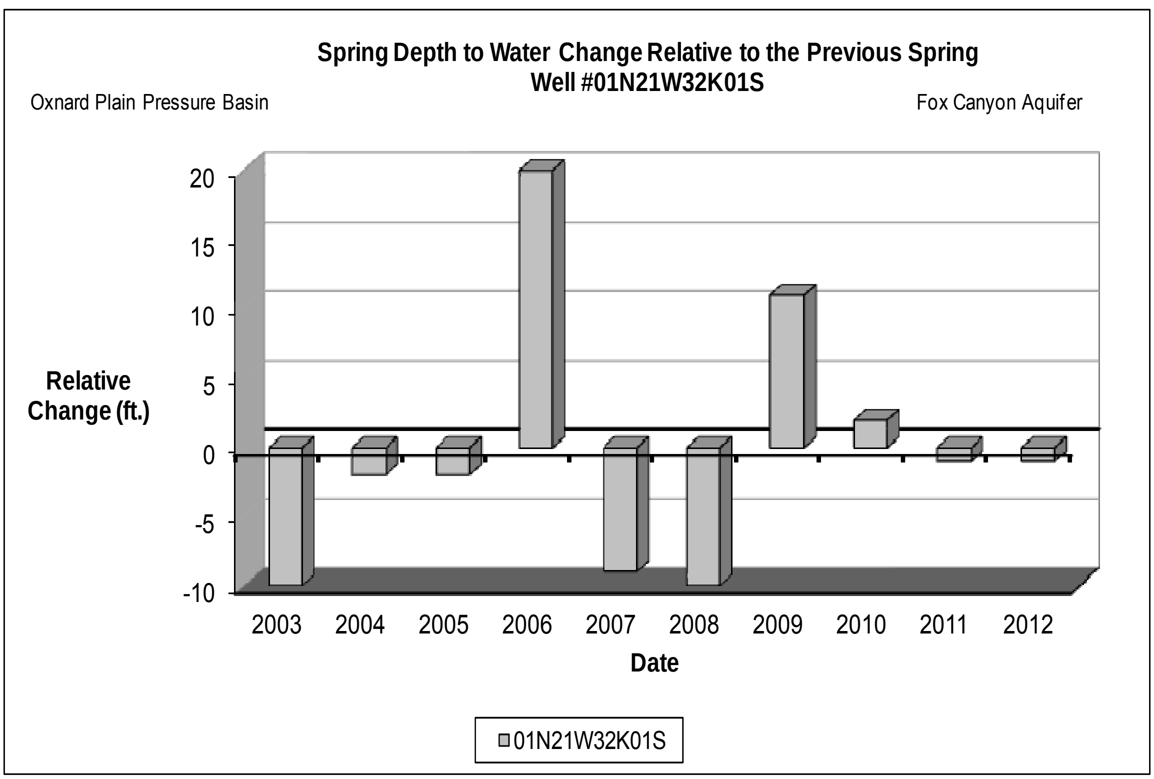

Figure B-7: Forebay Basin Fox Canyon Aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

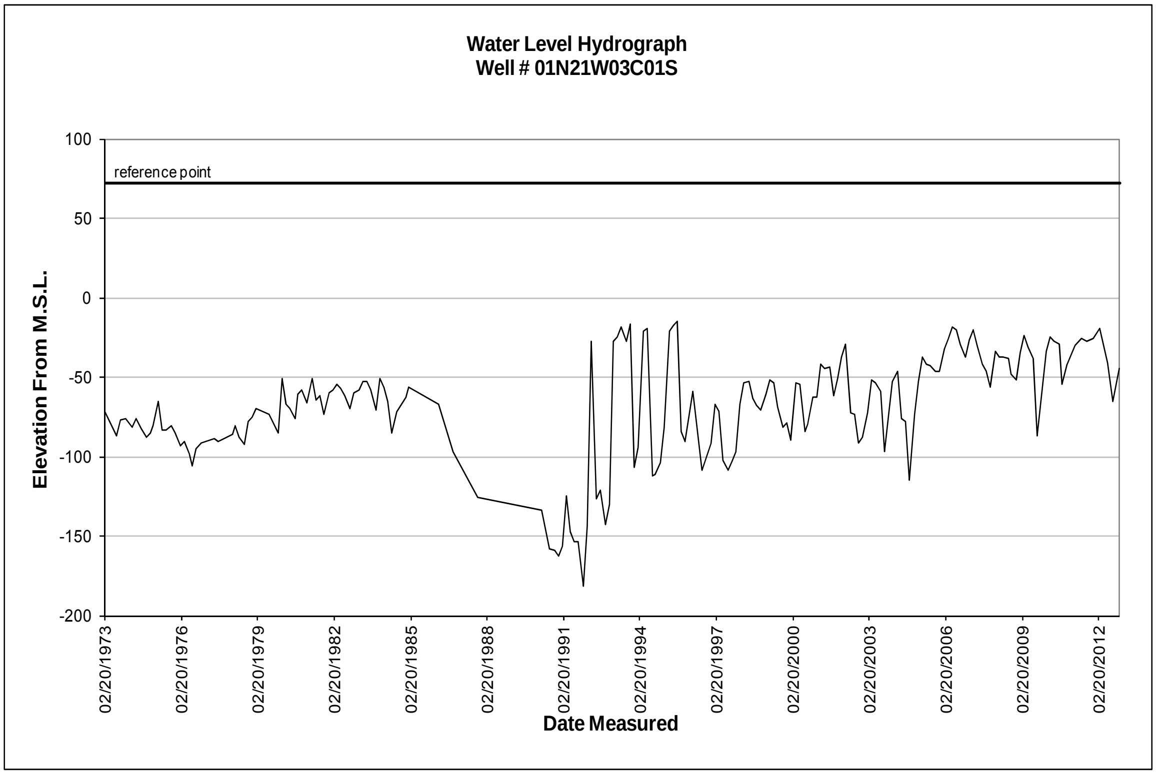

Figure B-8: Pleasant Valley Basin Fox Canyon Aquifer Key Well Hydrograph.

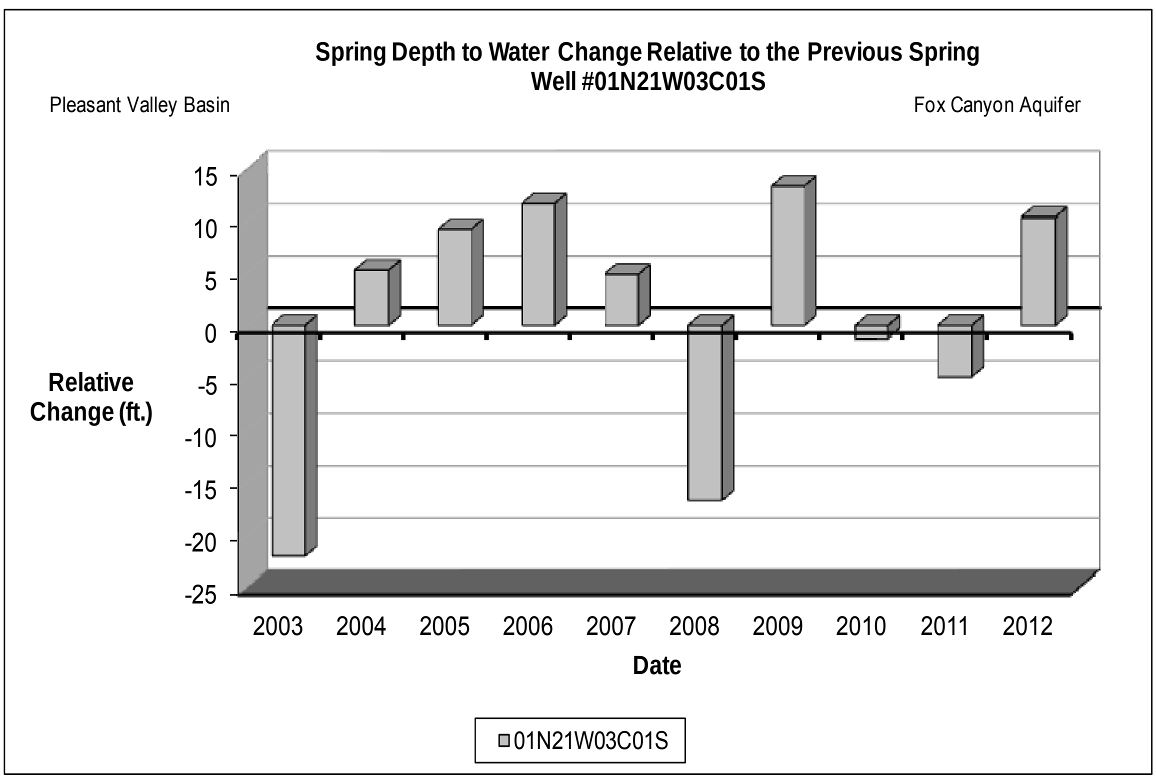

Figure B-9: Pleasant Valley Basin Fox Canyon Aquifer 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

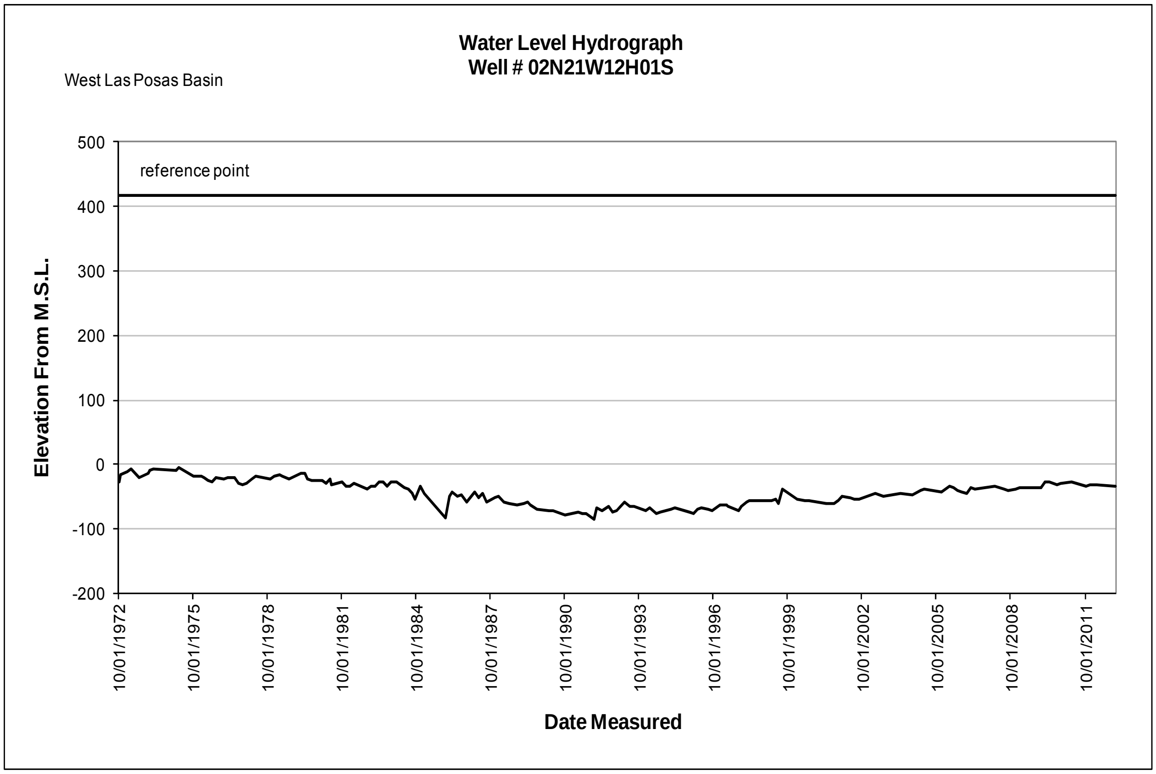

Figure B-10: West Las Posas Basin Key Well Hydrograph.

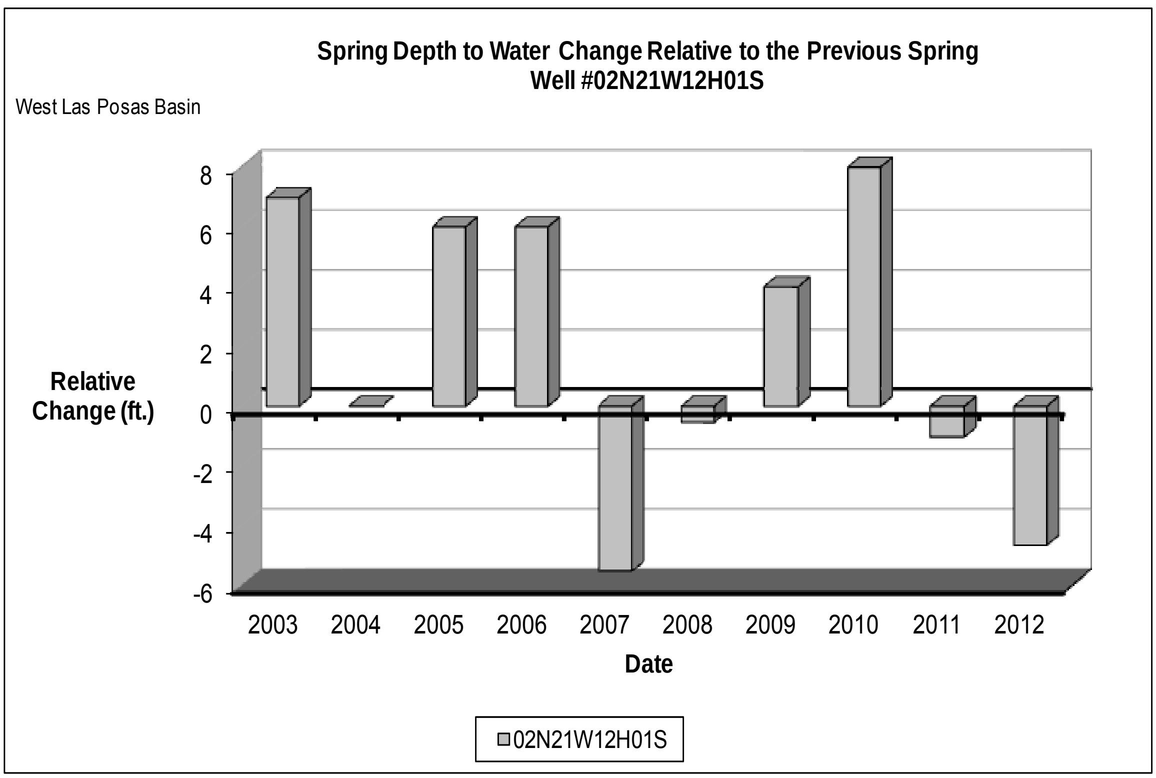

Figure B-11: West Las Posas Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

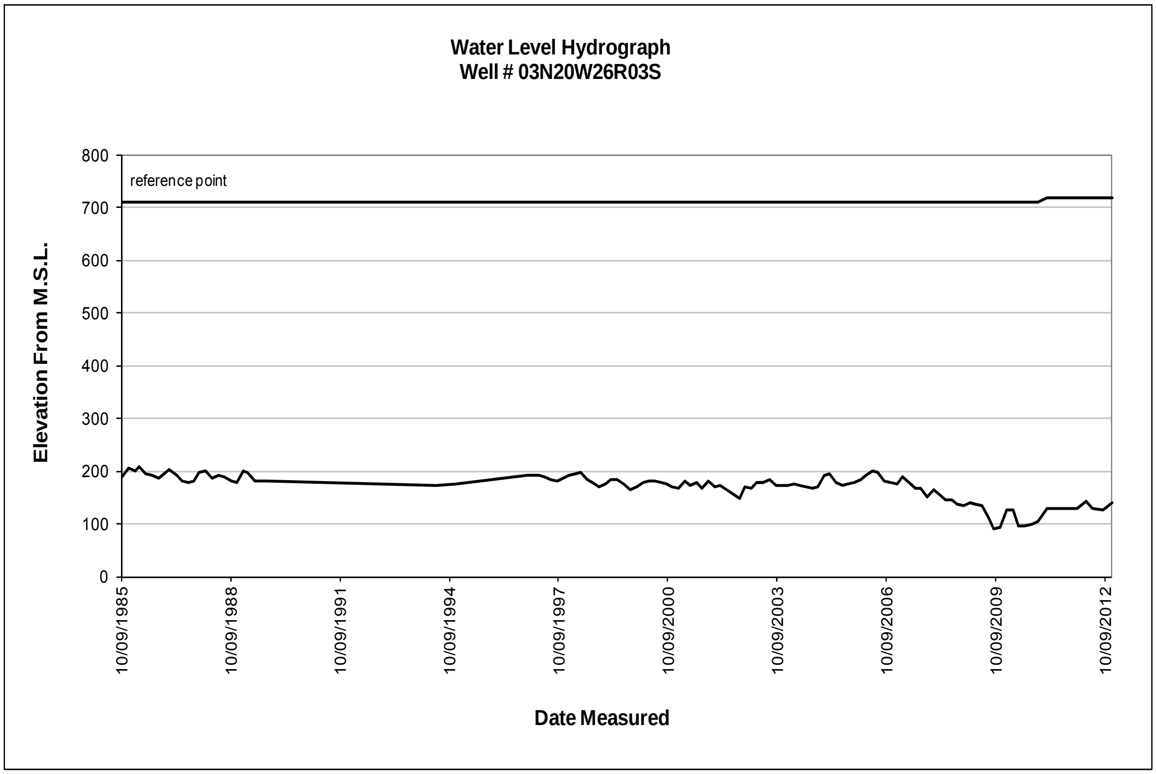

Figure B-12: East Las Posas Key Well Hydrograph.

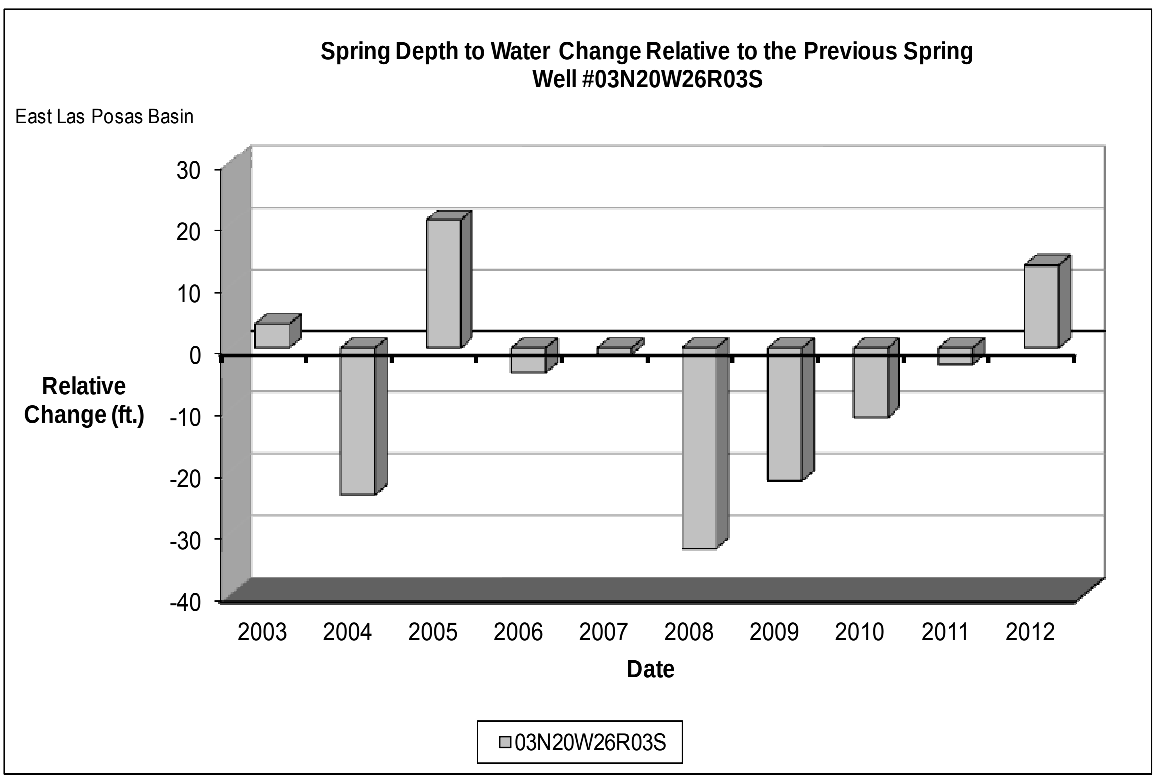

Figure B-13: East Las Posas Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

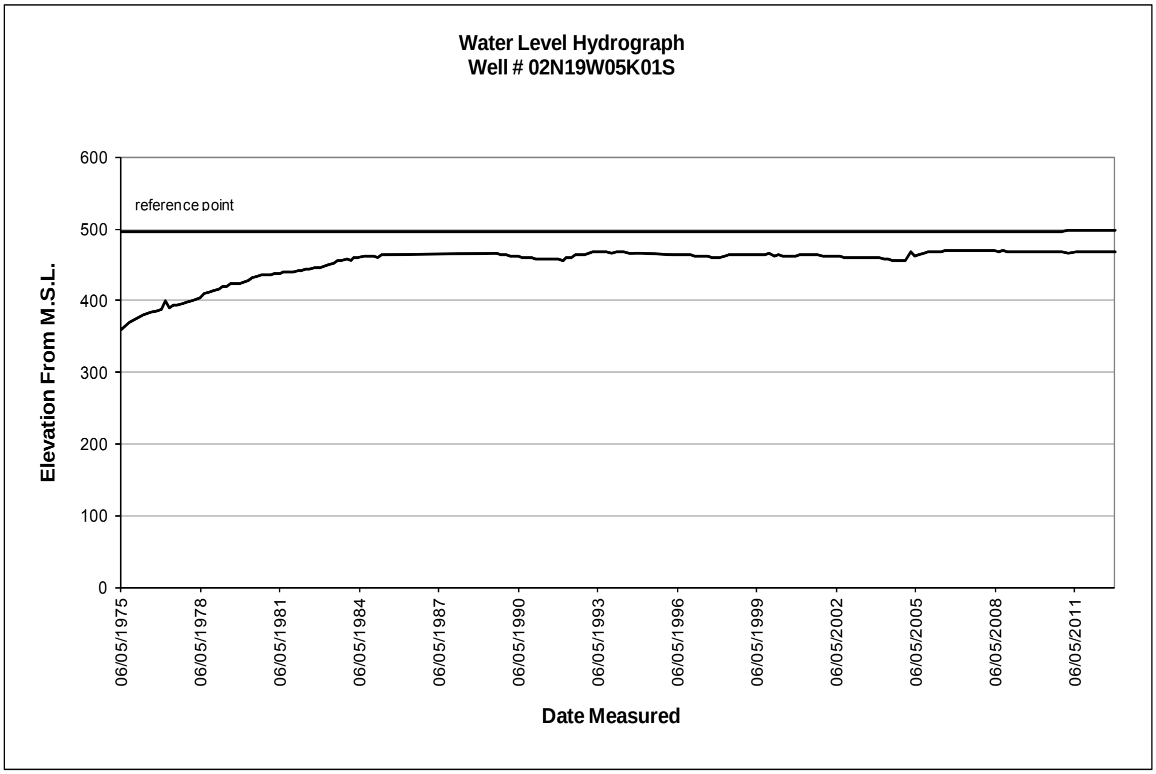

Figure B-14: South Las Posas Basin Key Well Hydrograph.

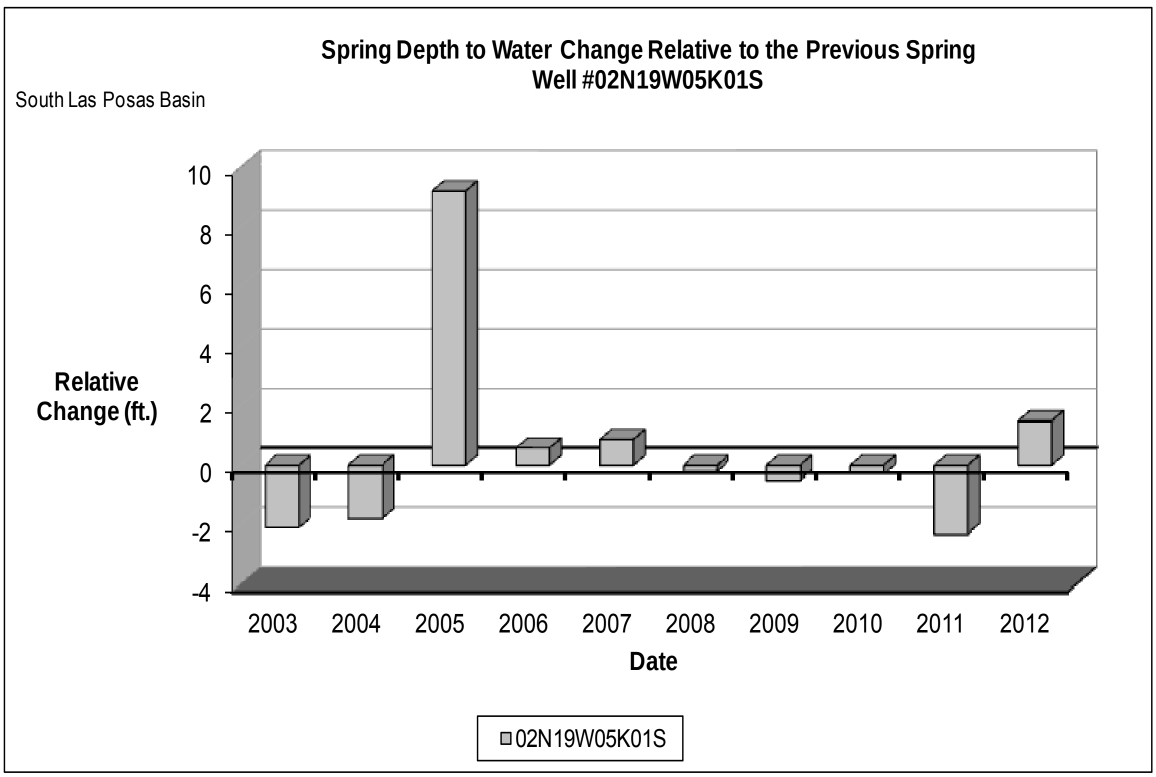

Figure B-15: South Las Posas Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

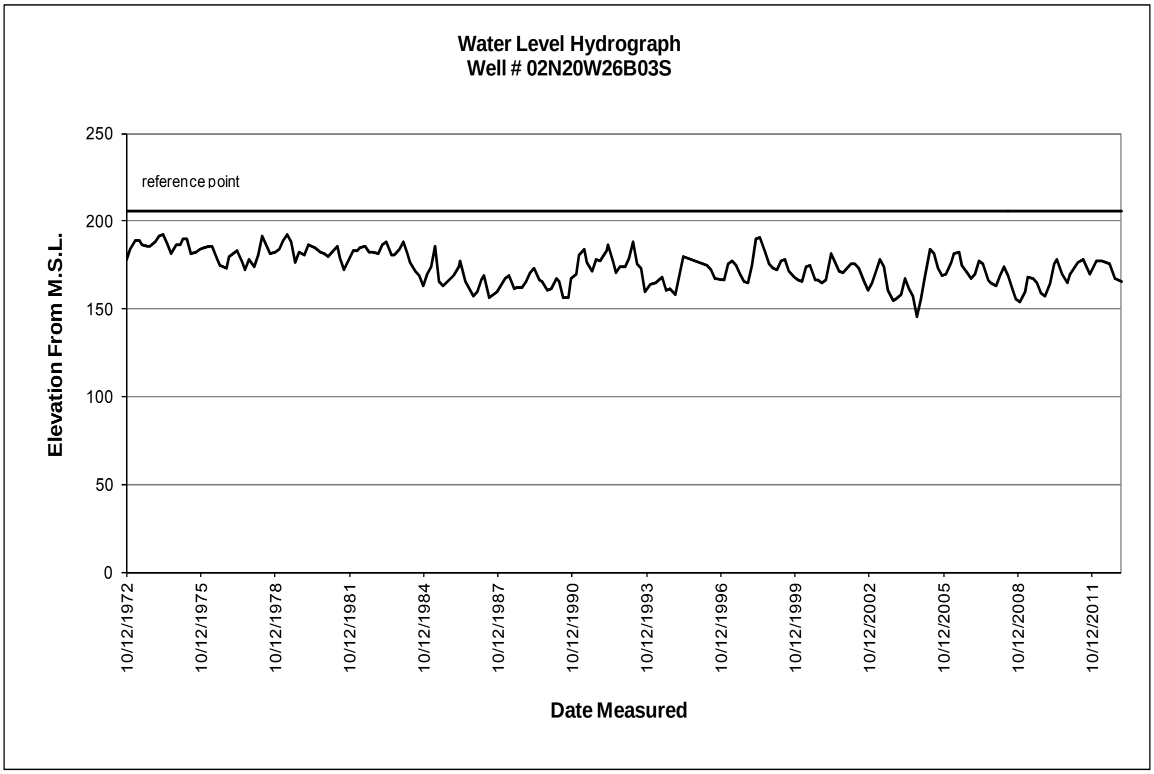

Figure B-16: Arroyo Santa Rosa Basin Key Well Hydrograph.

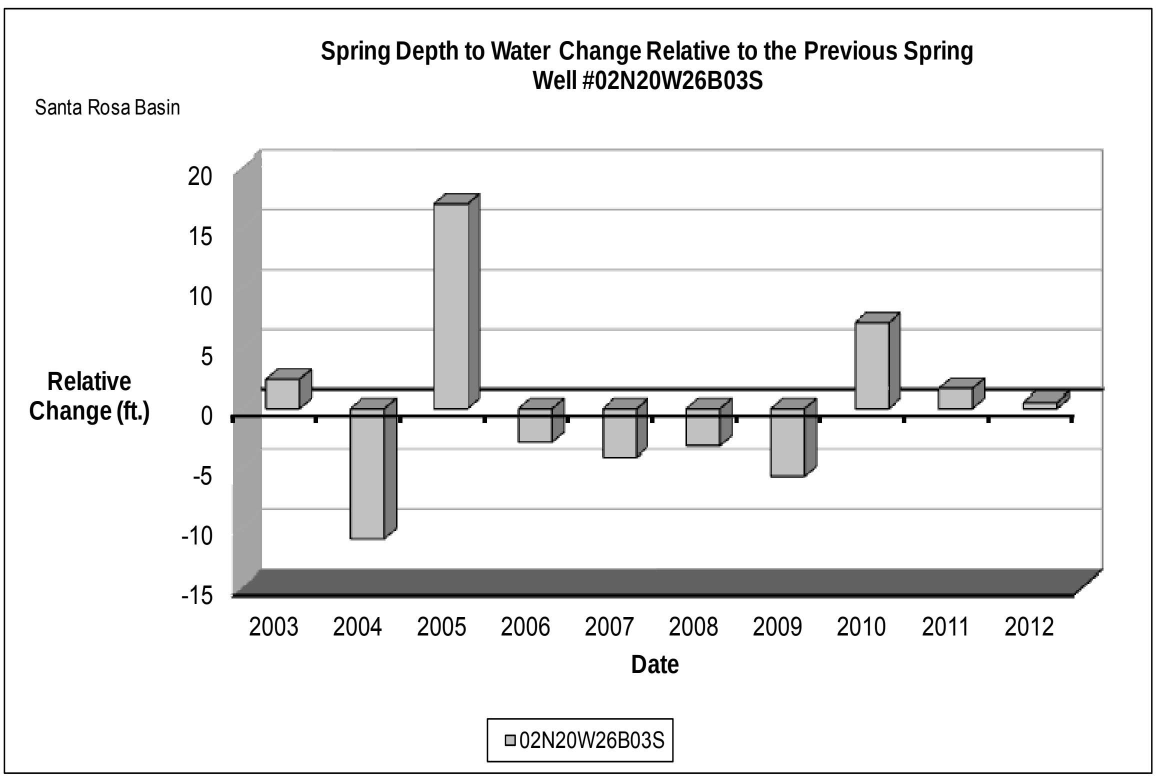

Figure B-17: Arroyo Santa Rosa Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

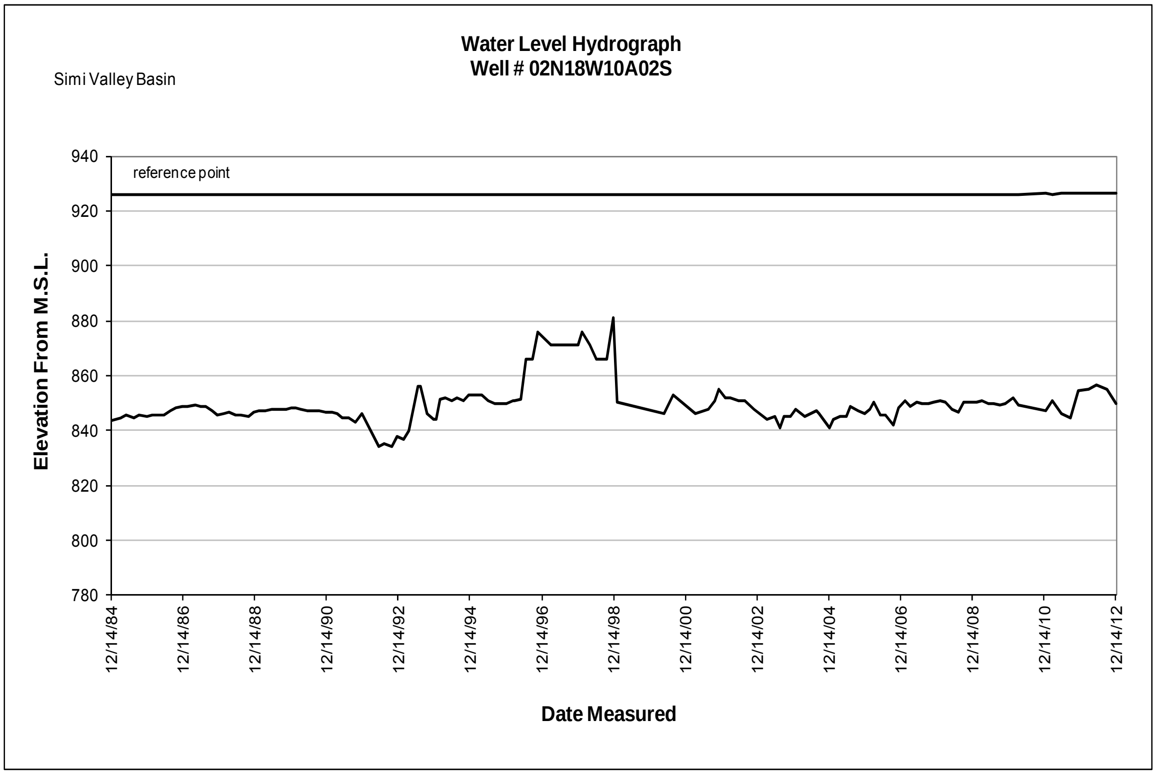

Figure B-18: Simi Valley Basin Key Well Hydrograph.

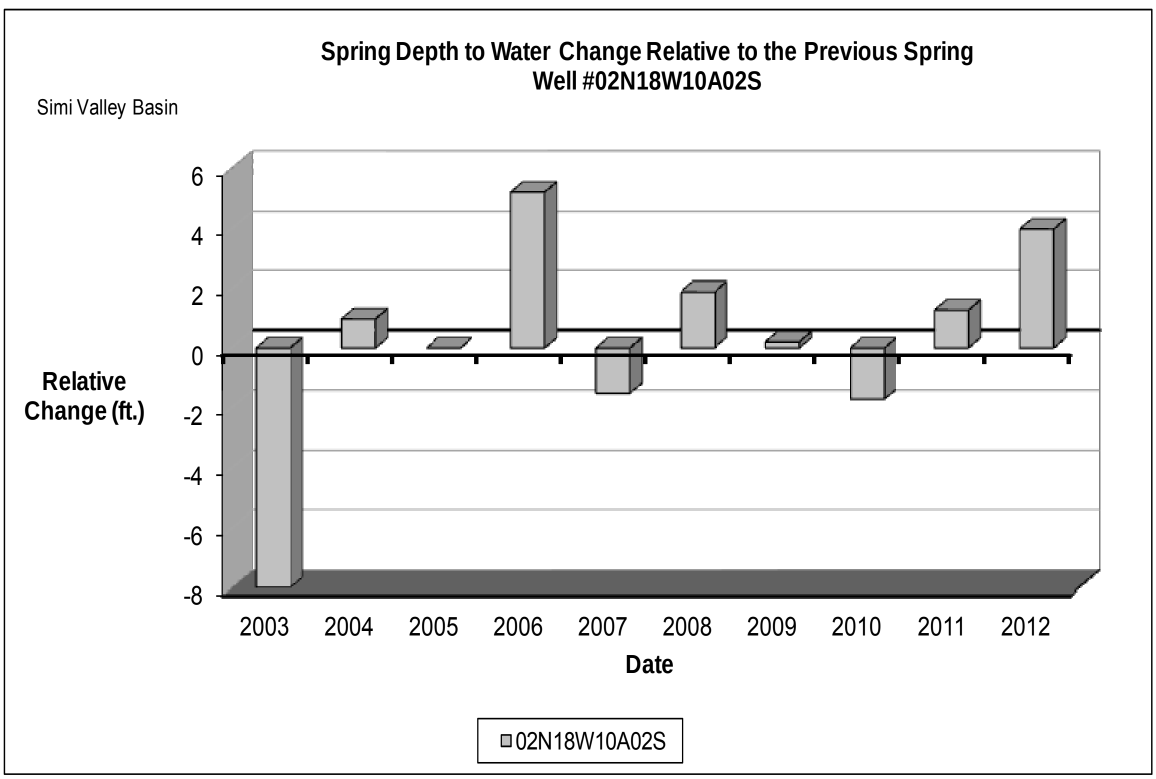

Figure B-19: Simi Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

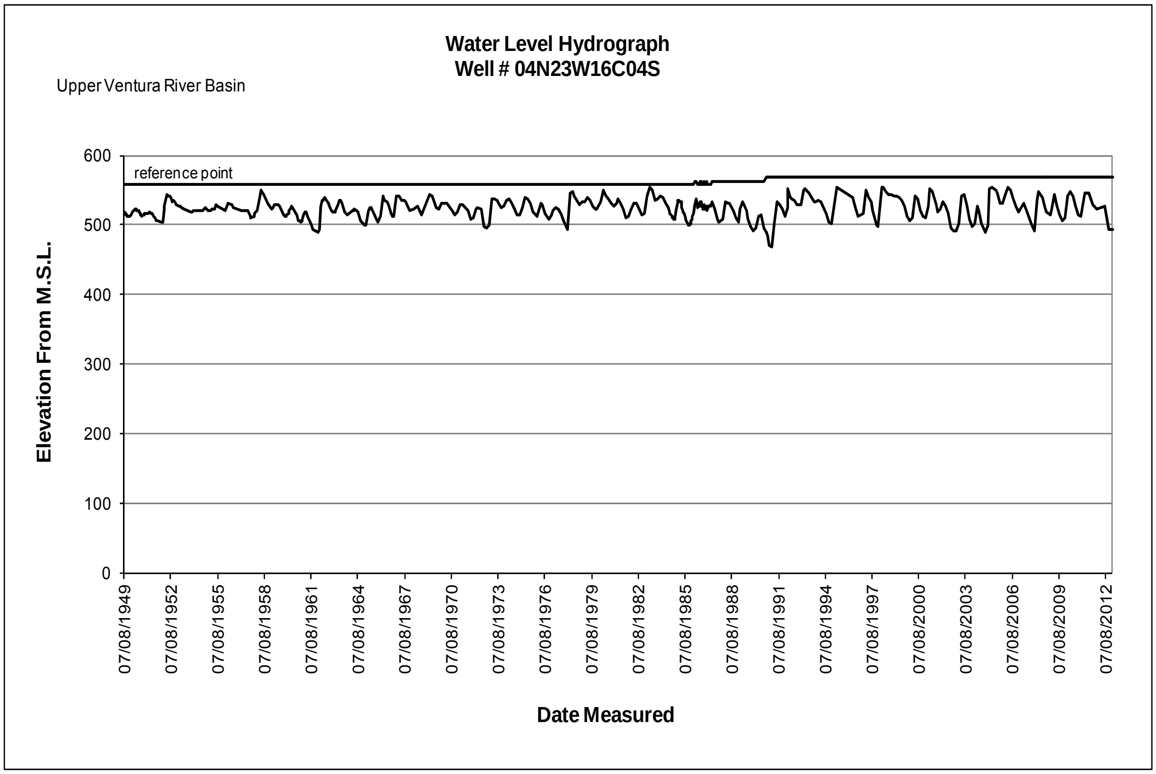

Figure B-20: Ventura River Basin Key Well Hydrograph.

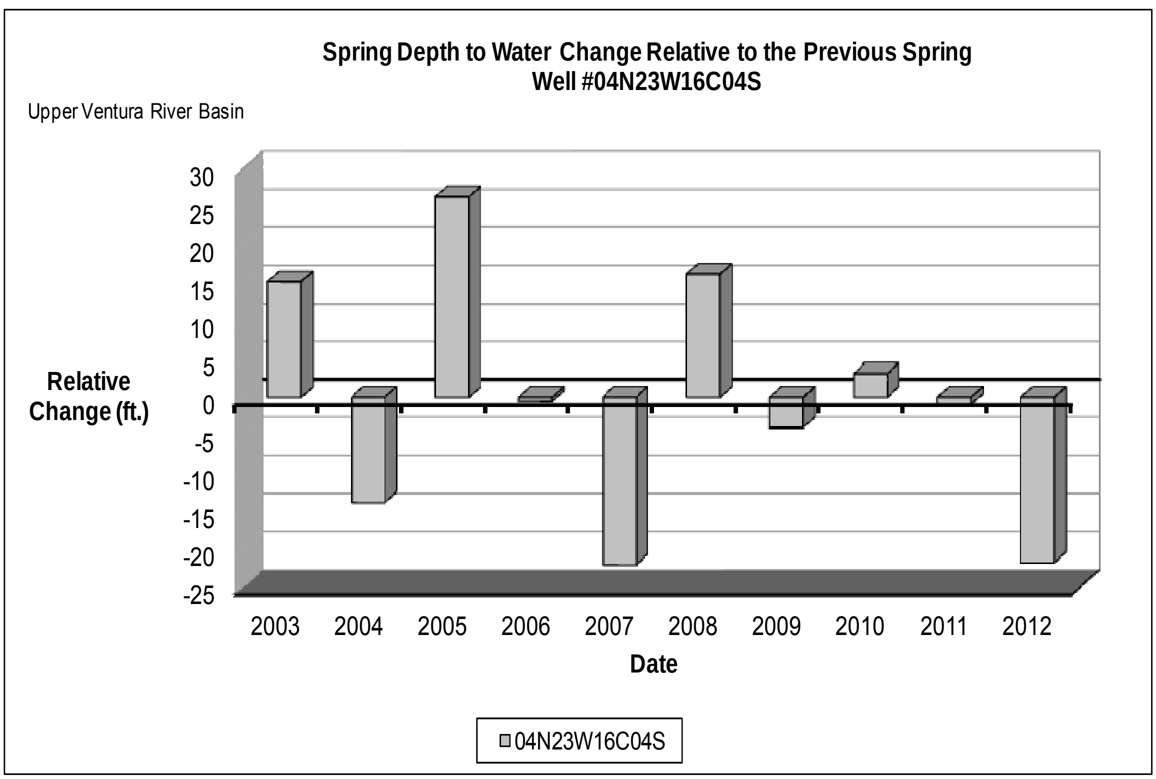

Figure B-21: Ventura River Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

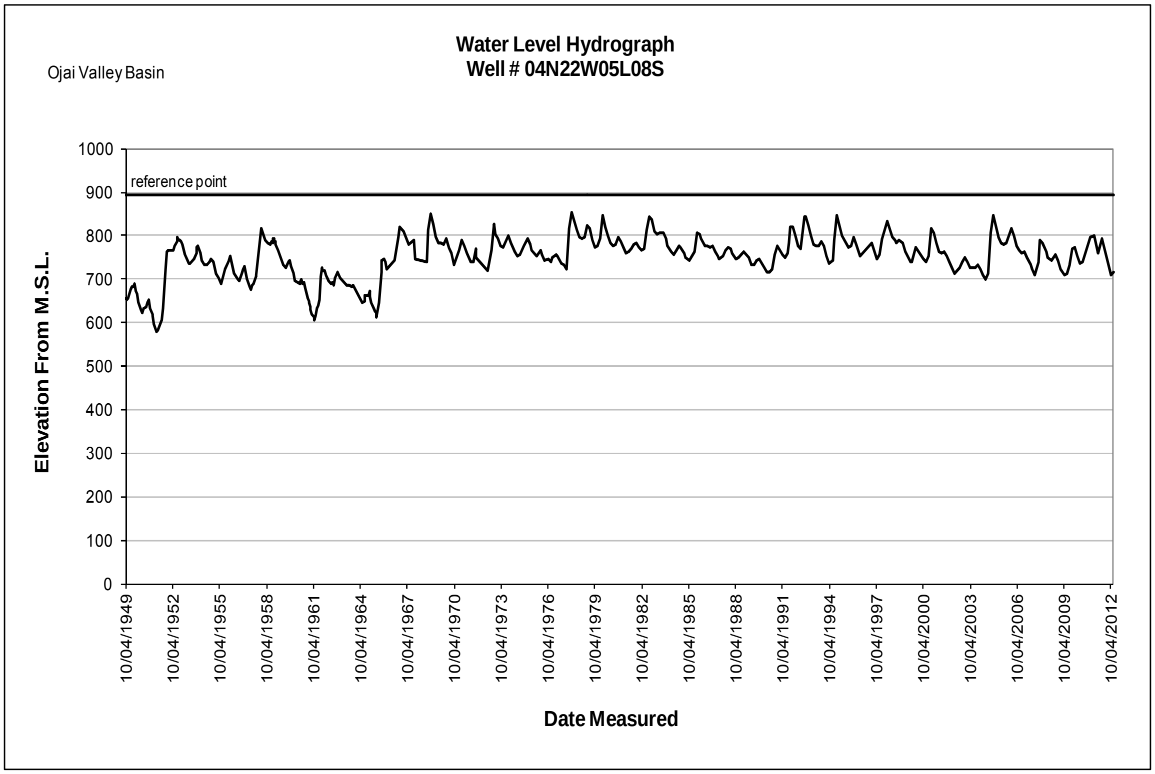

Figure B-22: Ojai Valley Basin Key Well Hydrograph.

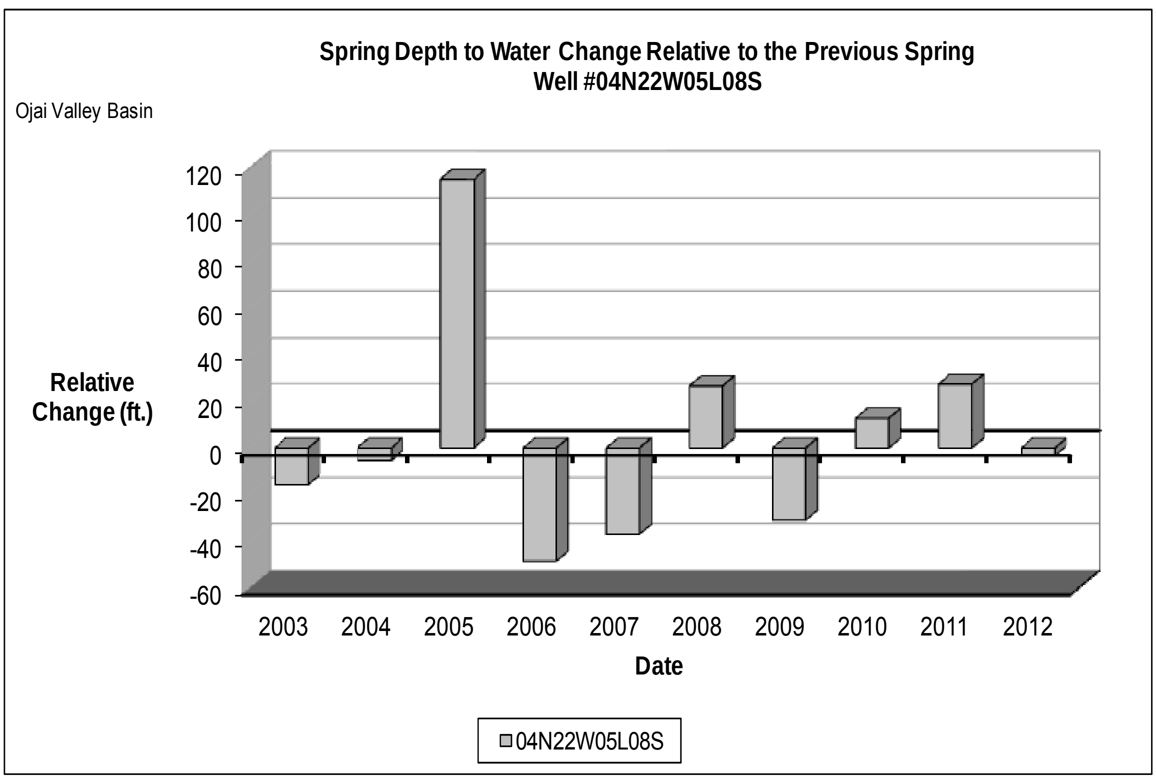

Figure B-23: Ojai Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

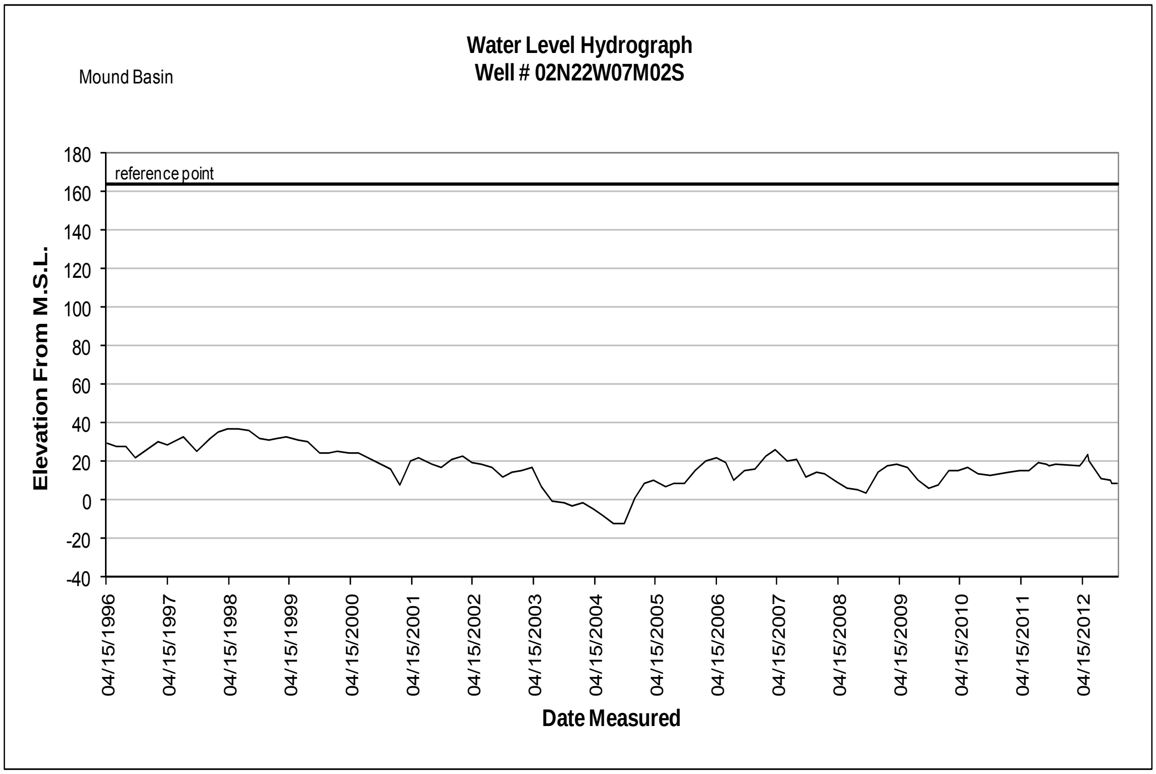

Figure B-24: Mound Basin Key Well Hydrograph.

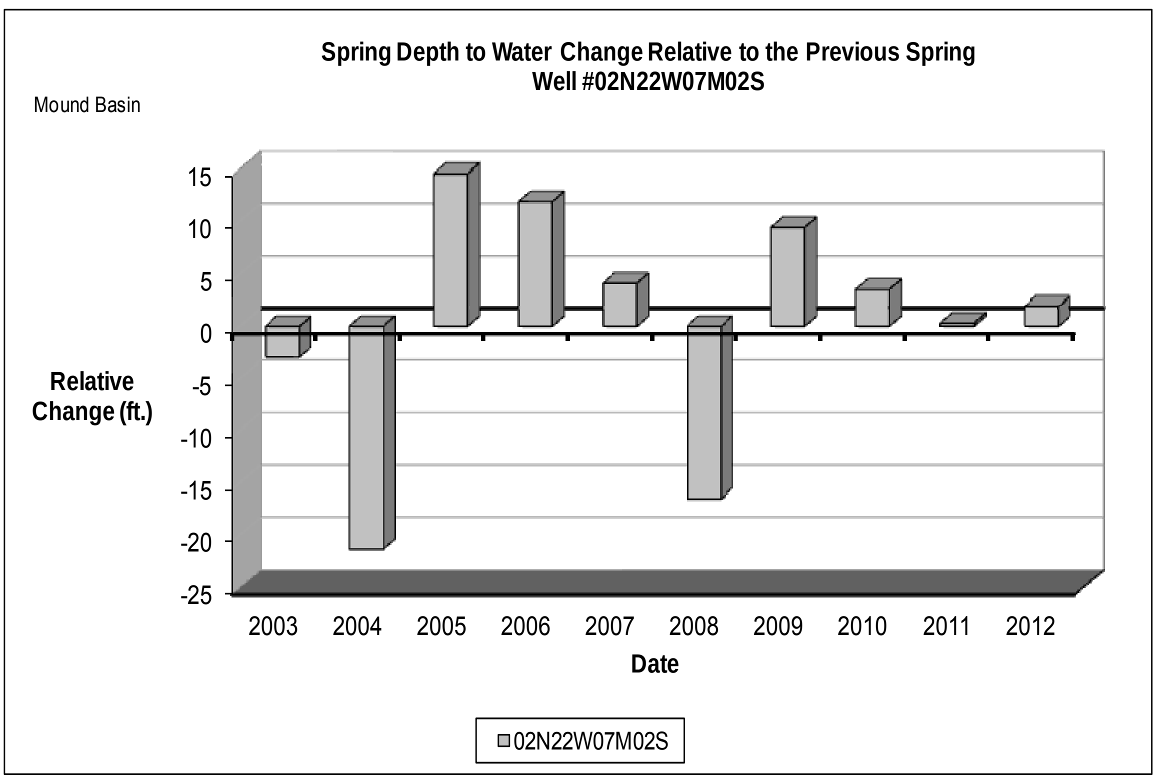

Figure B-25: Mound Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

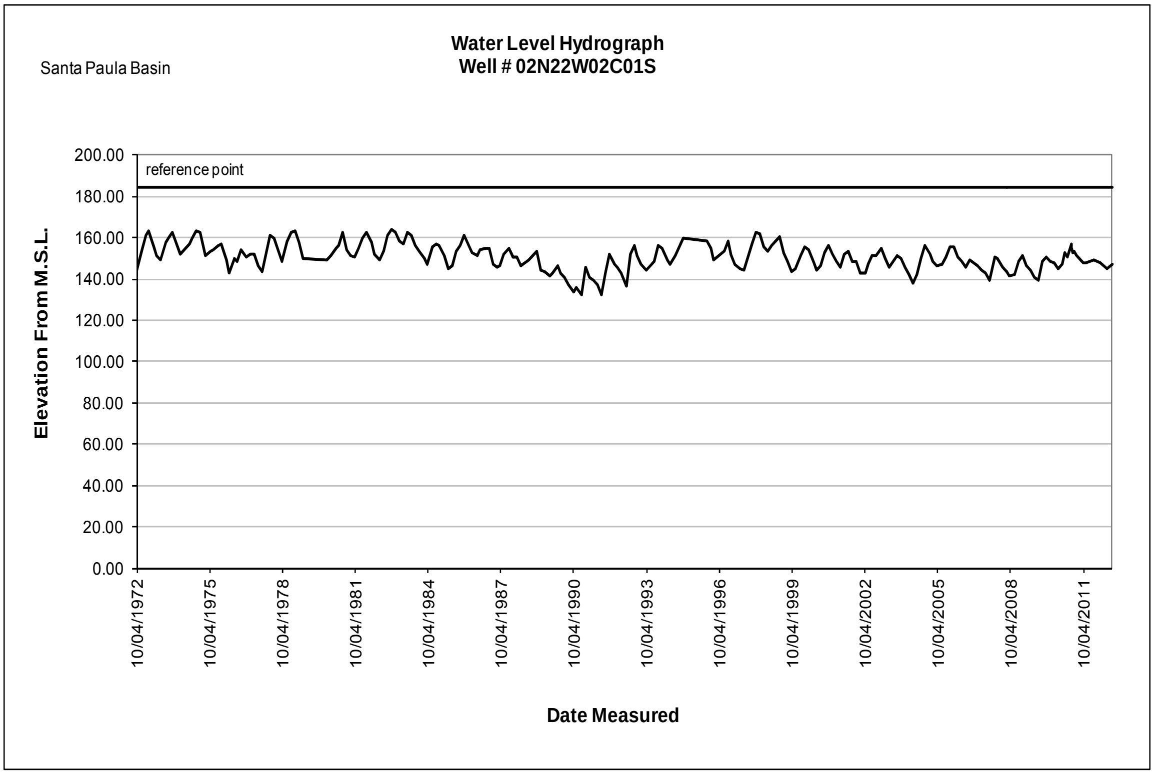

Figure B-26: Santa Paula Basin Key Well Hydrograph.

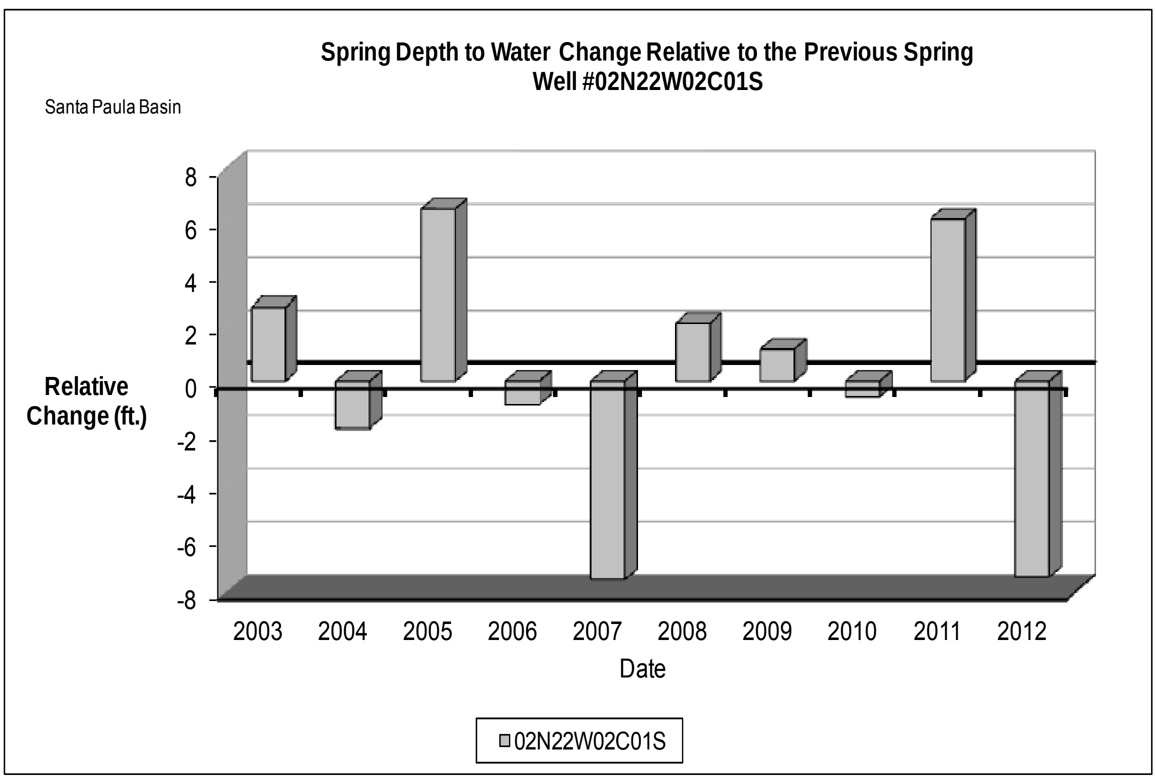

Figure B-27: Santa Paula Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

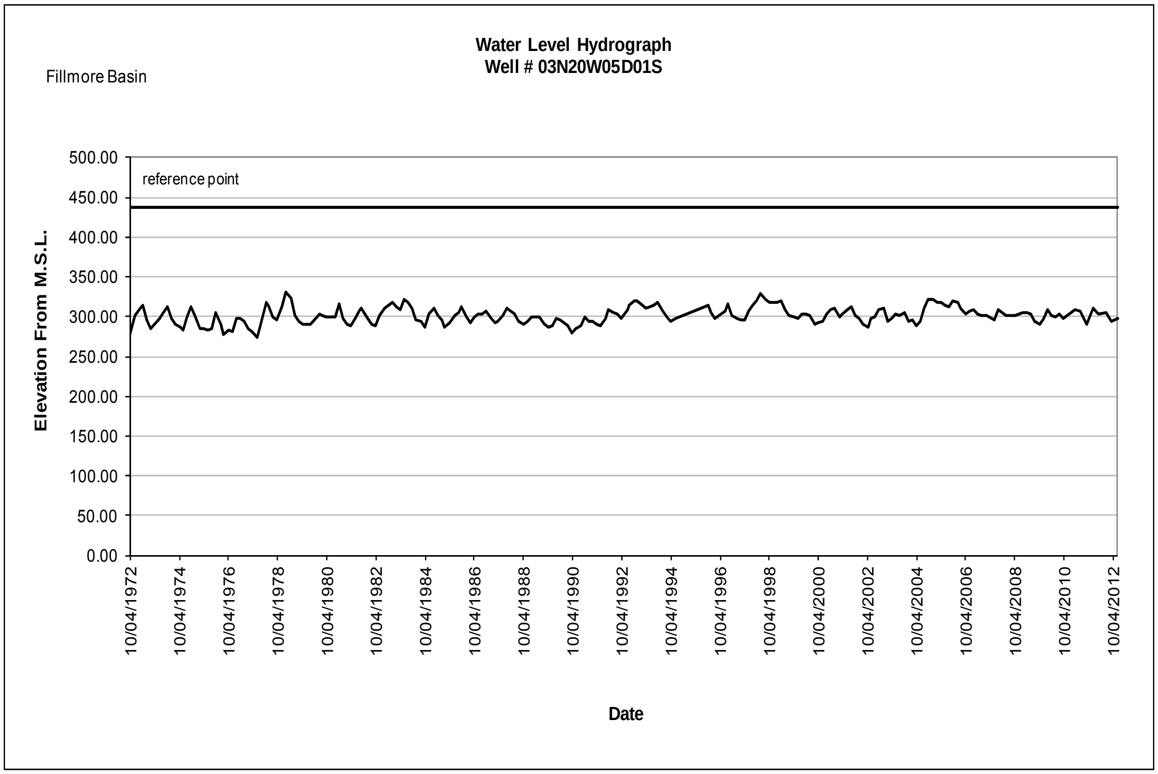

Figure B-28: Fillmore Basin Key Well Hydrograph.

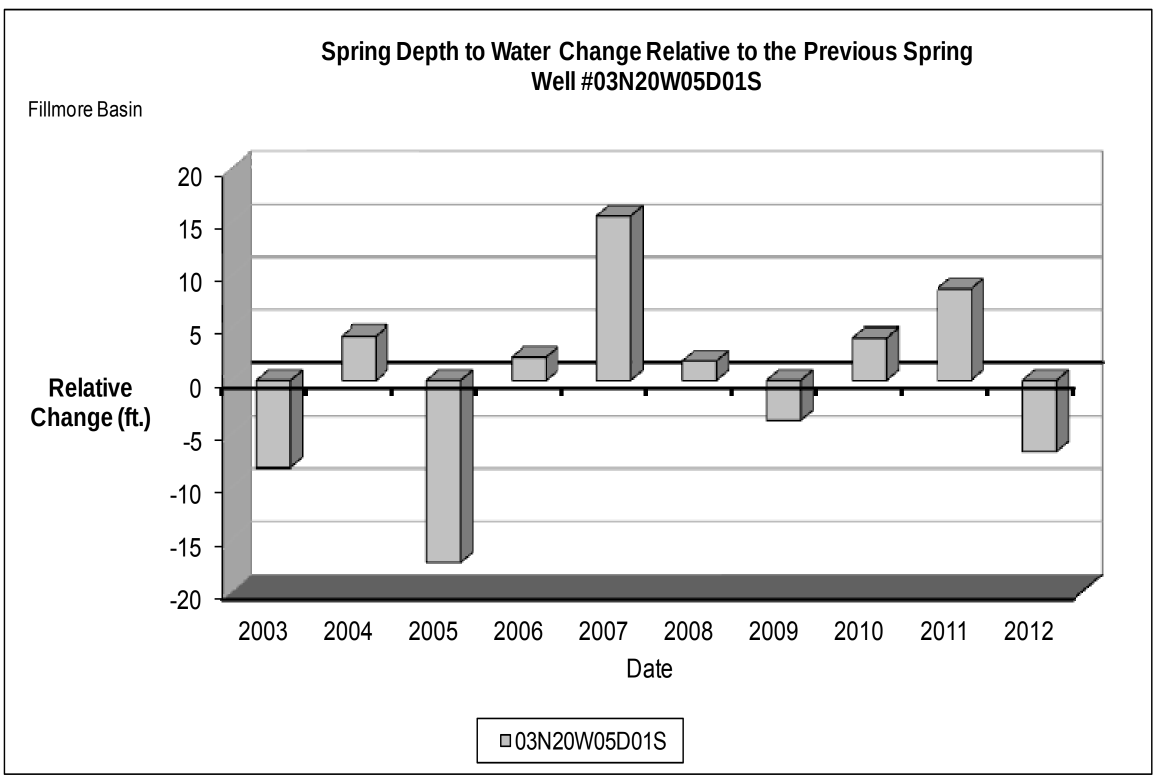

Figure B-29: Fillmore Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

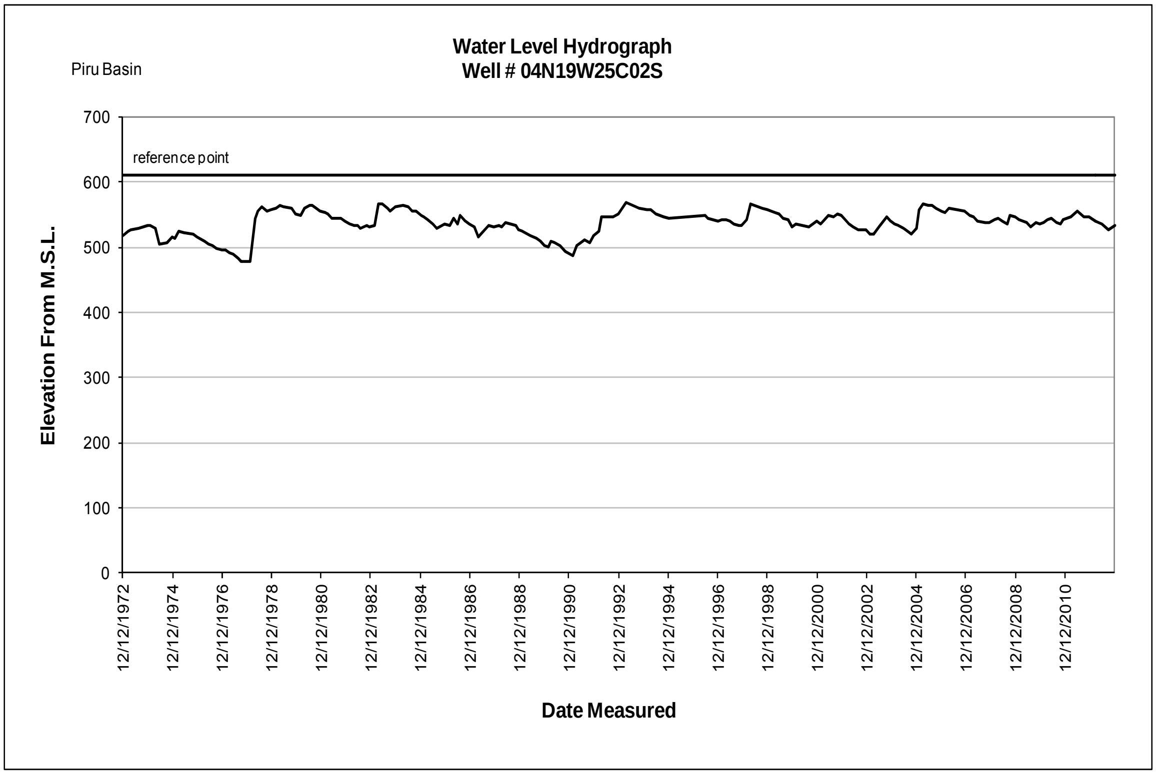

Figure B-30: Piru Basin Key Well Hydrograph.

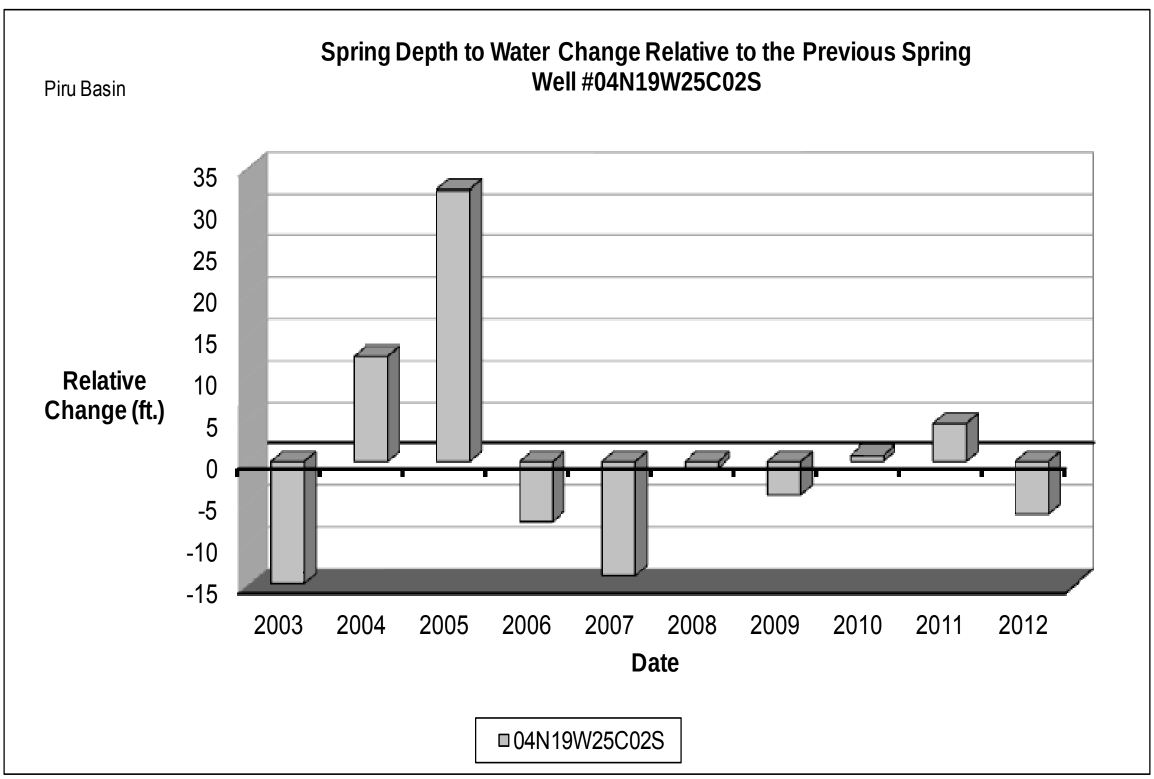

Figure B-31: Piru Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

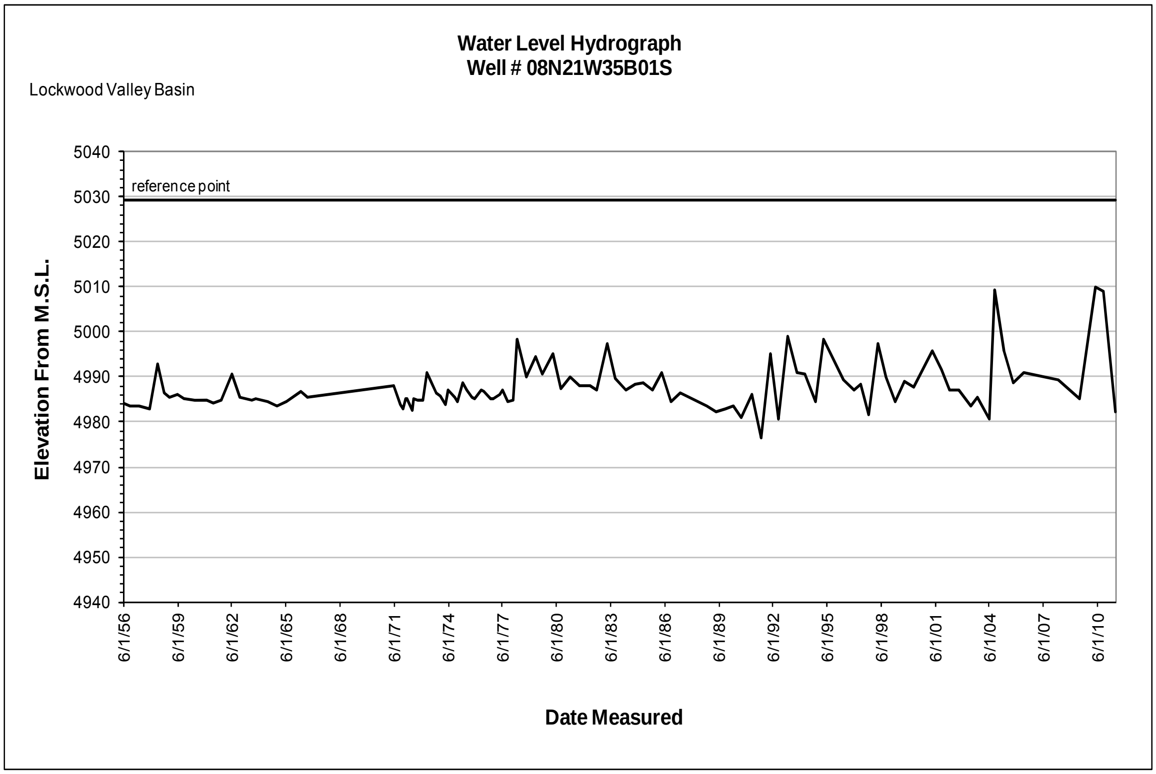

Figure B-32: Lockwood Valley Basin Key Well Hydrograph.

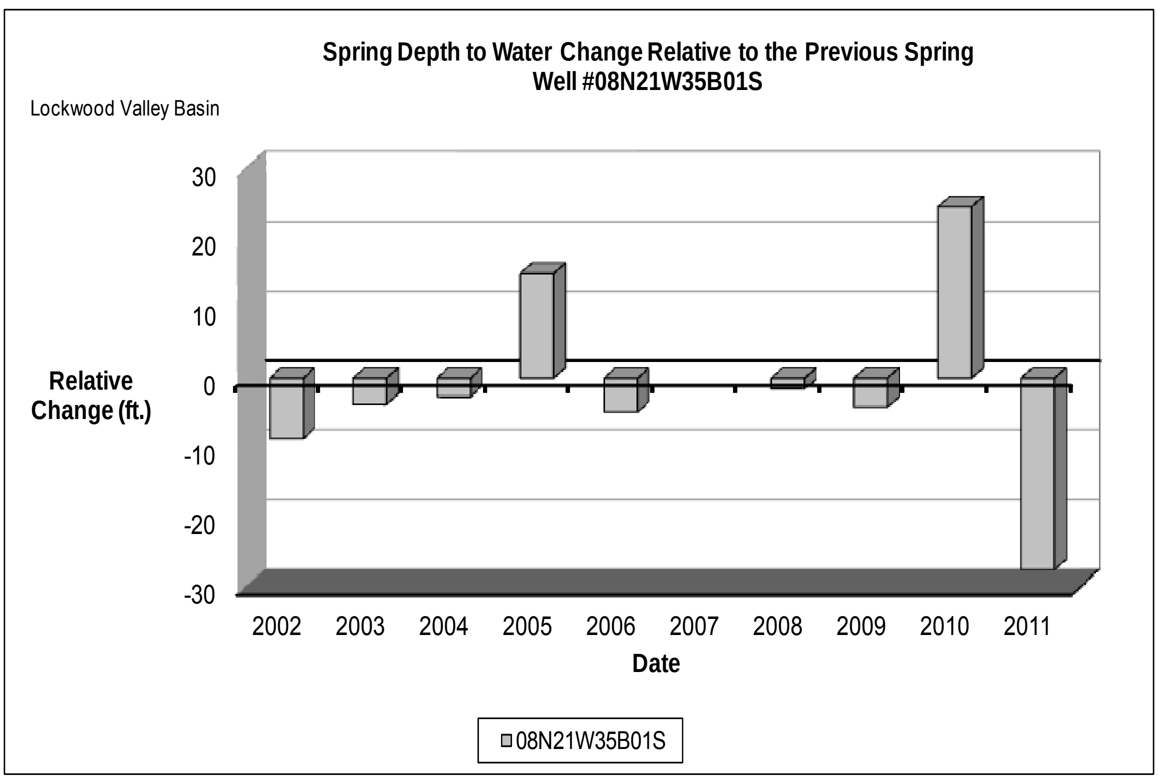

Figure B-33: Lockwood Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix B – Key Water Level Wells

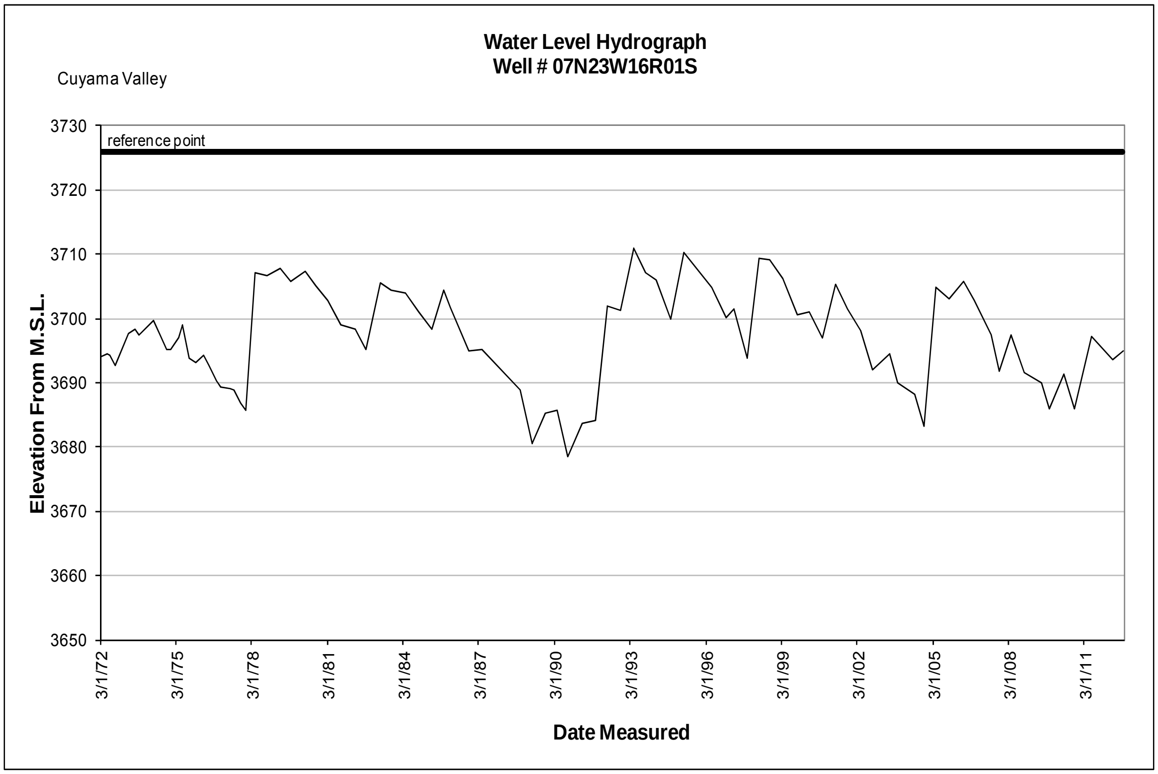

Figure B-34: Cuyama Valley Basin Key Well Hydrograph.

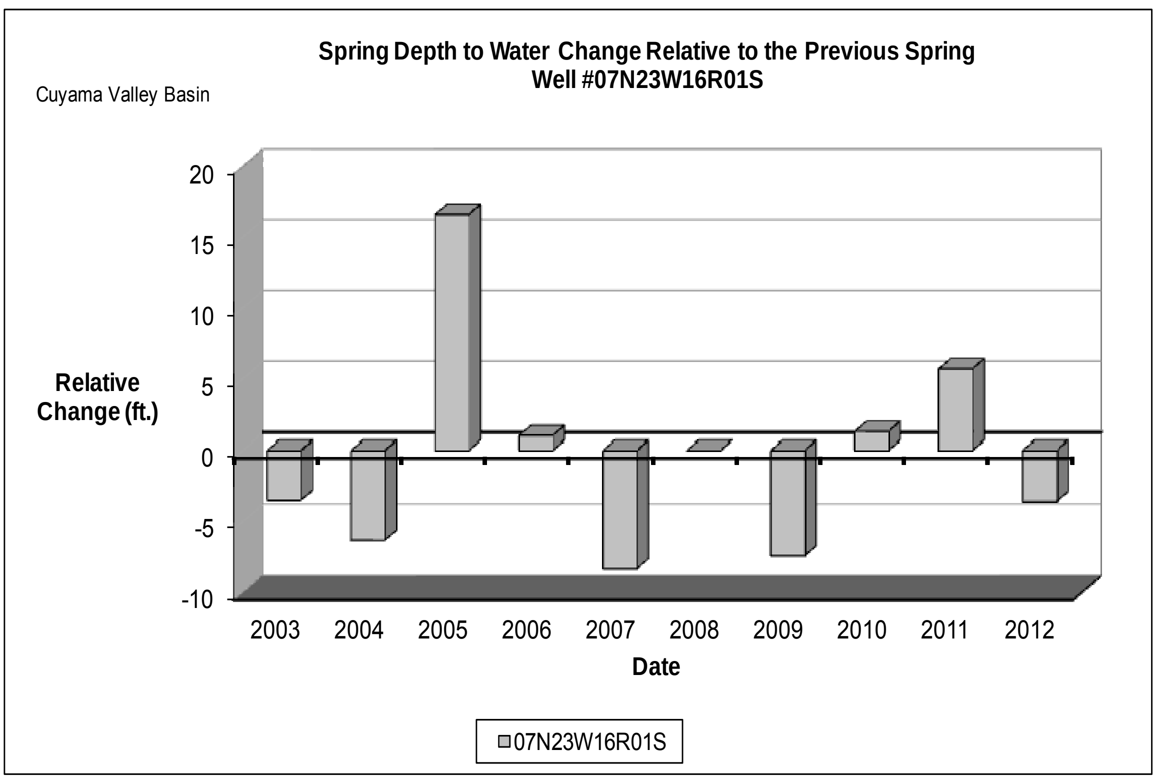

Figure B-35: Cuyama Valley Basin 10 year spring level change depicted on Up/Down graph.

Appendix C – Groundwater Level Measurement Data

Arroyo Santa Rosa	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N19W20L01S	03/08/2012	307.66	54.6	253.06	
	02N20W23G01S	03/08/2012	370.8	277	93.8	
	02N20W23K01S	03/08/2012	274.11	199.3	74.81	
	02N20W23R01S	03/08/2012	235.21	NM	-----	Pumping
	02N20W26B03S	03/08/2012	205.87	28.5	177.37	
Second Measure	02N19W20L01S	06/21/2012	307.66	55.1	252.56	
	02N20W23G01S	06/21/2012	370.8	277.1	93.7	
	02N20W23K01S	06/21/2012	274.11	200.2	73.91	
	02N20W23R01S	06/21/2012	235.21	NM	-----	Pumping
	02N20W26B03S	06/21/2012	205.87	30.1	175.77	
Third Measure	02N19W20L01S	09/12/2012	307.66	57.5	250.16	
	02N20W23G01S	09/12/2012	370.8	279.8	91	
	02N20W23K01S	09/12/2012	274.11	205.6	68.51	
	02N20W23R01S	09/12/2012	235.21	NM	-----	Pumping
	02N20W26B03S	09/12/2012	205.87	38.9	166.97	
Fourth Measure	02N19W20L01S	12/14/2012	307.66	57.9	249.76	
	02N20W23G01S	12/14/2012	370.8	278.8	92	
	02N20W23K01S	12/14/2012	274.11	205	69.11	
	02N20W23R01S	12/12/2012	235.21	70.93	164.28	
	02N20W26B03S	12/12/2012	205.87	40.51	165.36	

Conejo Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	01N19W07K16S	03/19/2012	635.46	8.00	627.46	
	01N20W03J01S	03/19/2012	764.40	46.49	717.91	
Second Measure	01N19W07K16S	06/05/2012	635.46	8.10	627.36	
	01N20W03J01S	06/05/2012	764.40	45.60	718.80	
Third Measure	01N19W07K16S	10/01/2012	635.46	10.55	624.91	
	01N20W03J01S	10/01/2012	764.40	48.20	716.20	
Fourth Measure	01N19W07K16S	12/20/2012	635.46	10.20	625.26	
	01N20W03J01S	12/20/2012	764.40	46.15	718.25	

Cuyama Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	07N23W16R01S	04/19/2012	3,726.00	32.45	3,693.55	Nearby Pumping
	07N24W13C03S	04/19/2012	3,435.00	26.60	3,408.40	
Second Measure	07N23W16R01S	09/27/2012	3,726.00	31.1	3694.9	
	07N24W13C03S	09/27/2012	3,435.00	31.7	3403.3	

Appendix C – Groundwater Level Measurement Data

Fillmore	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	03N19W06D02S	03/05/2012	434.60	47.90	386.70	
	03N20W01C04S	03/05/2012	404.58	28.90	375.68	
	03N20W05D01S	03/05/2012	437.12	134.20	302.92	
	03N20W09D01S	03/05/2012	325.20	NM	-----	Pumping
	03N20W11C01S	03/05/2012	397.11	43.70	353.41	
	03N21W01P02S	03/05/2012	301.85	49.60	252.25	
	03N21W11B01S	03/05/2012	336.24	98.70	237.54	
	04N19W30D01S	03/09/2012	434.43	46.70	387.73	
	04N19W31R01S	03/05/2012	448.85	NM	-----	Pumping
	04N19W32M02S	03/05/2012	449.46	NM	-----	Pumping
	04N19W33D04S	03/09/2012	477.90	3.00	474.90	
	04N20W23Q02S	03/05/2012	513.88	124.5	389.38	
	04N20W26C02S	03/05/2012	505.35	134.50	370.85	
	04N20W33C03S	03/05/2012	526.87	NM	-----	Pumping
Second Measure	03N19W06D02S	06/18/2012	434.60	48.60	386.00	
	03N20W01C04S	06/18/2012	404.58	29.87	374.71	
	03N20W05D01S	06/18/2012	437.12	132.43	304.69	
	03N20W09D01S	06/18/2012	325.20	9.30	315.90	
	03N20W11C01S	06/18/2012	397.11	44.80	352.31	
	03N21W01P02S	06/18/2012	301.85	NM	-----	Special
	03N21W11B01S	06/18/2012	336.24	90.08	246.16	
	04N19W30D01S	06/18/2012	434.43	NM	-----	Pumping
	04N19W31R01S	06/18/2012	448.85	NM	-----	Pumping
	04N19W32M02S	06/18/2012	449.46	15.94	433.52	
	04N19W33D03S	06/18/2012	477.43	NM	-----	Pumping
	04N19W33D04S	06/18/2012	477.90	3.4	474.5	
	04N20W23Q02S	06/18/2012	513.88	127.40	386.48	
	04N20W26C02S	06/18/2012	505.35	137.20	368.15	
	04N20W33C03S	06/18/2012	526.87	NM	-----	Pumping
Third Measure	03N19W06D02S	09/04/2012	434.60	53.31	381.29	
	03N20W01C04S	09/04/2012	404.58	33.48	371.10	
	03N20W05D01S	09/04/2012	437.12	142.70	294.42	
	03N20W09D01S	09/13/2012	325.20	11.05	314.15	
	03N20W11C01S	09/04/2012	397.11	48.03	349.08	
	03N21W01P02S	09/04/2012	301.85	NM	-----	Special
	03N21W11B01S	09/04/2012	336.24	97.00	239.24	
	04N19W30D01S	09/04/2012	434.43	NM	-----	Pumping
	04N19W31R01S	09/13/2012	448.85	53.36	395.49	
	04N19W32M02S	09/04/2012	449.46	NM	-----	Pumping
	04N19W33D04S	09/04/2012	477.90	4.90	473.00	
	04N20W23Q02S	09/04/2012	513.88	132.8	381.08	
	04N20W26C02S	09/04/2012	505.35	124.90	380.45	
	04N20W33C03S	09/04/2012	526.87	167.00	359.87	
	04N20W33C03S	09/07/2011	526.87	172.00	354.87	

Appendix C – Groundwater Level Measurement Data

Fillmore	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fourth Measure	03N19W06D02S	12/10/2012	434.60	47.82	386.78	
	03N20W01C04S	12/10/2012	404.58	28.80	375.78	
	03N20W05D01S	12/10/2012	437.12	139.00	298.12	
	03N20W09D01S	12/10/2012	325.20	7.40	317.80	
	03N20W11C01S	12/10/2012	397.11	44.30	352.81	
	03N21W01P02S	12/10/2012	301.85	NM	-----	Special
	03N21W11B01S	12/10/2012	336.24	85.10	251.14	
	04N19W30D01S	12/10/2012	434.43	43.8	390.63	
	04N19W31R01S	12/10/2012	448.85	47.2	401.65	
	04N19W32M02S	12/10/2012	449.46	14	435.46	
	04N19W33D03S	12/10/2012	477.43	NM	-----	Pumping
	04N19W33D04S	12/10/2012	477.90	5.15	472.75	
	04N20W23Q02S	12/10/2012	513.88	133.55	380.33	
	04N20W26C02S	12/10/2012	505.35	137.50	367.85	Recently Pumped
	04N20W33C03S	12/10/2012	526.87	164.50	362.37	

East Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N20W10D02S	03/21/2012	459.53	274.9	184.63	
	02N20W10G01S	03/21/2012	415.47	149.8	265.67	
	02N20W10J01S	03/27/2012	406.87	113.86	293.01	
	03N19W17Q01S	04/16/2012	1,311.06	1,094.00	217.06	
	03N19W19J01S	03/22/2012	1,026.90	845.50	181.40	
	03N19W29F06S	03/22/2012	855.20	232.8	622.4	
	03N19W29K04S	03/22/2012	843.32	355.80	487.52	
	03N20W25H01S	04/18/2012	823.84	220.2	603.64	
	03N20W26R03S	03/28/2012	717.81	575.00	142.81	
	03N20W27H03S	03/28/2012	840.25	601.1	239.15	
	03N20W34G01S	03/27/2012	680.48	521	159.48	
	03N20W35R02S	03/28/2012	572.67	425.48	147.19	
	03N20W35R03S	03/28/2012	572.67	416.50	156.17	
	03N20W35R04S	03/28/2012	572.67	295.84	276.83	
Second Measure	02N20W01M01S	06/14/2012	470.05	NM	-----	Pumping
	02N20W03K03S	06/14/2012	485.50	NM	-----	Special
	02N20W10D02S	06/05/2012	459.53	283.8	175.73	
	02N20W10G01S	06/14/2012	415.47	NM	-----	Pumping
	02N20W10J01S	06/06/2012	406.87	114.10	292.77	
	03N19W17Q01S	06/14/2012	1,311.06	NM	-----	Pumping
	03N19W19J01S	06/14/2012	1,026.90	844.90	182.00	
	03N19W19P02S	06/14/2012	1,057.94	NM	-----	Special
	03N19W29F06S	06/06/2012	855.20	245.76	609.44	
	03N19W29K04S	06/14/2012	843.32	NM	-----	Pumping
	03N20W23L01S	06/14/2012	970.30	NM	-----	Special
	03N20W25H01S	06/14/2012	823.84	224.9	598.94	
	03N20W26R03S	06/06/2012	717.81	587.6	130.21	
	03N20W27H03S	06/06/2012	840.25	605.8	234.45	Nearby Pumping
	03N20W34G01S	06/06/2012	680.48	522.2	158.28	
	03N20W35R03S	06/06/2012	572.67	431.10	141.57	Nearby Pumping

Appendix C – Groundwater Level Measurement Data

East Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Third Measure	02N20W01M01S	09/24/2012	470.05	NM	-----	Pumping
	02N20W03K03S	09/24/2012	485.50	NM	-----	Pumping
	02N20W10D02S	09/24/2012	459.53	295.00	164.53	
	02N20W10G01S	10/23/2012	415.47	156.55	258.92	
	02N20W10J01S	09/24/2012	406.87	115.90	290.97	
	03N19W17Q01S	11/06/2012	1,311.06	1094	217.06	
	03N19W19J01S	09/14/2012	1,026.90	848.40	178.50	
	03N19W19P02S	09/14/2012	1,057.94	NM	-----	Special
	03N19W29F06S	09/14/2012	855.20	247.00	608.20	
	03N19W29K04S	09/24/2012	843.32	656.5	186.82	
	03N20W23L01S	09/14/2012	970.30	NM	-----	Special
	03N20W25H01S	09/24/2012	823.84	222.4	601.44	
	03N20W26R03S	09/19/2012	717.81	591.30	126.51	
	03N20W27H03S	10/25/2012	840.25	610.50	229.75	
	03N20W34G01S	09/19/2012	680.48	538.20	142.28	
	03N20W35R03S	09/19/2012	572.67	430.70	141.97	
Fourth Measure	02N20W01M01S	12/12/2012	470.05	NM	-----	Special
	02N20W03K03S	12/12/2012	485.50	NM	-----	Special
	02N20W10D02S	12/11/2012	459.53	295.85	163.68	
	02N20W10G01S	12/11/2012	415.47	155.8	259.67	
	02N20W10J01S	12/11/2012	406.87	114.80	292.07	
	03N19W19J01S	12/13/2012	1,026.90	847.2	179.7	
	03N19W19P02S	12/13/2012	1,057.94	NM	-----	Inaccessible
	03N19W29F06S	12/11/2012	855.20	239.25	615.95	
	03N19W29K04S	12/13/2012	843.32	649.6	193.72	
	03N20W23L01S	12/13/2012	970.30	NM	-----	Inaccessible
	03N20W25H01S	12/13/2012	823.84	218.54	605.3	
	03N20W26R03S	12/17/2012	717.81	576.8	141.01	
	03N20W27H03S	12/12/2012	840.25	607.90	232.35	
	03N20W34G01S	12/12/2012	680.48	533.2	147.28	
	03N20W35R03S	12/17/2012	572.67	417.3	155.37	

South Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N19W05K01S	03/21/2012	497.80	29.10	468.70	
	02N19W08H02S	03/21/2012	494.87	23.45	471.42	
Second Measure	02N19W05K01S	06/05/2012	497.80	29.00	468.80	
	02N19W08H02S	06/05/2012	494.87	23.80	471.07	
Third Measure	02N19W05K01S	10/03/2012	497.80	29.30	468.50	
	02N19W08H02S	09/14/2012	494.87	23.60	471.27	
Fourth Measure	02N19W05K01S	12/13/2012	497.80	0.00	497.80	
	02N19W08H02S	12/17/2012	494.87	0.00	494.87	

Appendix C – Groundwater Level Measurement Data

West Las Posas	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N21W09D02S	04/04/2012	323.75	226.8	96.95	
	02N21W10G03S	03/24/2012	381.01	352.20	28.81	
	02N21W11J03S	03/21/2012	379.39	420.40	-41.01	
	02N21W11J04S	03/21/2012	379.39	377.10	2.29	
	02N21W11J05S	03/21/2012	379.39	206.00	173.39	
	02N21W11J06S	03/21/2012	379.39	178.90	200.49	
	02N21W12H01S	03/21/2012	417.89	449.60	-31.71	
	02N21W15M03S	03/21/2012	263.87	134.70	129.17	
	02N21W16J01S	03/21/2012	259.90	11.81	248.09	
	03N21W35P02S	04/04/2012	564.11	547.80	16.31	
Second Measure	02N20W06R01S	06/14/2012	461.19	NM	-----	Pumping
	02N20W07R02S	06/14/2012	395.00	NM	-----	Special
	02N20W08F01S	06/14/2012	436.17	NM	-----	Pumping
	02N21W09D02S	06/06/2012	323.75	208.30	115.45	
	02N21W10G03S	06/14/2012	381.01	NM	-----	Pumping
	02N21W11J03S	06/06/2012	379.39	422.30	-42.91	
	02N21W11J04S	06/06/2012	379.39	375.60	3.79	
	02N21W11J05S	06/06/2012	379.39	203.90	175.49	
	02N21W11J06S	06/06/2012	379.39	176.50	202.89	
	02N21W12H01S	06/14/2012	417.89	NM	-----	Pumping
	02N21W15M03S	06/06/2012	263.87	136.60	127.27	
	02N21W16J01S	06/06/2012	259.90	12.00	247.90	Nearby Pumping
	03N21W35P02S	06/14/2012	564.11	NM	-----	Pumping
Third Measure	02N20W06R01S	09/24/2012	461.19	NM	-----	Pumping
	02N20W07R02S	10/03/2012	395.00	NM	-----	Pumping
	02N20W08F01S	09/24/2012	436.17	NM	-----	Pumping
	02N21W09D02S	10/23/2012	323.75	243.60	80.15	
	02N21W10G03S	10/03/2012	381.01	358.00	23.01	
	02N21W11J03S	09/24/2012	379.39	428.50	-49.11	
	02N21W11J04S	09/24/2012	379.39	380.40	-1.01	
	02N21W11J05S	09/24/2012	379.39	210.30	169.09	
	02N21W11J06S	09/24/2012	379.39	178.30	201.09	
	02N21W12H01S	09/24/2012	417.89	NM	-----	Pumping
	02N21W15M03S	09/14/2012	263.87	136.80	127.07	
	02N21W16J01S	09/14/2012	259.90	12.14	247.76	
	03N21W35P02S	09/24/2012	564.11	507.30	56.81	
Fourth Measure	02N20W06R01S	12/13/2012	461.19	568.34	-107.15	
	02N20W07R02S	12/13/2012	395.00	502.90	-107.90	
	02N20W08F01S	12/12/2012	436.17	544.1	-107.93	
	02N21W09D02S	12/12/2012	323.75	225.40	98.35	
	02N21W10G03S	12/13/2012	381.01	356.3	24.71	
	02N21W11J03S	12/12/2012	379.39	421.90	-42.51	
	02N21W11J04S	12/12/2012	379.39	380.40	-1.01	
	02N21W11J05S	12/12/2012	379.39	209.90	169.49	
	02N21W11J06S	12/12/2012	379.39	180.10	199.29	
	02N21W12H01S	12/12/2012	417.89	452.20	-34.31	
	02N21W15M03S	12/11/2012	263.87	136.20	127.67	
	02N21W16J01S	12/11/2012	259.90	12.70	247.20	
	03N21W35P02S	12/12/2012	564.11	489.00	75.11	

Appendix C – Groundwater Level Measurement Data

Lockwood Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	08N21W33R03S	04/19/2012	5150	39	5111	
	08N21W35B01S	04/19/2012	5029.2	NM	-----	Dry
	08N21W36G02S	04/19/2012	4922	19.7	4902.3	
Second Measure	08N21W33R03S	11/01/2012	5150	40.7	5109.3	
	08N21W35B01S	09/27/2012	5029.2	NM	-----	Special
	08N21W36G02S	09/27/2012	4922	NM	-----	Special
Mound	**SWN**	**Date**	**RP**	**Depth Below RP**	**Elev. Above MSL**	**Note**
First Measure	02N22W08P01S	03/09/2012	213.79	153.00	60.79	
	02N22W09L03S	03/09/2012	251.25	118.30	132.95	
	02N22W16K01S	03/06/2012	149.37	114.70	34.67	
	02N23W13K03S	03/06/2012	68.71	NM	-----	Pumping
Second Measure	02N22W08P01S	06/18/2012	213.79	159.90	53.89	
	02N22W09L03S	06/18/2012	251.25	186.00	65.25	
	02N22W16K01S	06/20/2012	149.37	119.70	29.67	
	02N23W13K03S	06/19/2012	68.71	57.90	10.81	
Third Measure	02N22W08P01S	09/17/2012	213.79	163.30	50.49	
	02N22W09L03S	09/05/2012	251.25	186.30	64.95	
	02N22W16K01S	09/05/2012	149.37	129.85	19.52	
	02N23W13K03S	09/05/2012	68.71	NM	-----	Pumping
Fourth Measure	02N22W08P01S	12/14/2012	213.79	155.20	58.59	
	02N22W09L03S	12/11/2012	251.25	187.00	64.25	
	02N22W16K01S	12/11/2012	149.37	131.00	18.37	
	02N23W13K03S	12/11/2012	68.71	60.20	8.51	
Ojai Valley	**SWN**	**Date**	**RP**	**Depth Below RP**	**Elev. Above MSL**	**Note**
First Measure	04N22W04Q01S	03/29/2012	1,045.50	86.70	958.80	
	04N22W05D03S	03/15/2012	895.97	156.65	739.32	
	04N22W05H04S	03/15/2012	950.22	196.90	753.32	
	04N22W05L08S	03/15/2012	892.09	97.62	794.47	
	04N22W05M01S	03/15/2012	843.47	106.05	737.42	
	04N22W06D01S	03/15/2012	846.66	92.80	753.86	
	04N22W06D05S	03/29/2012	853.21	98.19	755.02	
	04N22W06K03S	02/21/2012	801.80	101.00	700.80	
	04N22W06K12S	03/15/2012	812.70	106.05	706.65	
	04N22W06M01S	03/15/2012	794.78	60.50	734.28	
	04N22W07B02S	03/16/2012	773.77	53.90	719.87	
	04N22W07G01S	03/29/2012	771.20	31.87	739.33	
	04N22W08B02S	03/16/2012	870.57	125.50	745.07	
	04N23W01K02S	03/15/2012	786.38	26.05	760.33	
	04N23W02K01S	03/15/2012	869.49	3.35	866.14	
	04N23W12H02S	03/29/2012	716.61	25.00	691.61	
	04N23W12L02S	03/29/2012	682.50	NM	-----	Tape Hung Up
	05N22W32J02S	03/29/2012	1,139.80	58.07	1,081.73	

Appendix C – Groundwater Level Measurement Data

Ojai Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Second Measure	04N22W04Q01S	06/07/2012	1,045.50	NM	-----	Pumping
	04N22W05D03S	06/04/2012	895.97	162.40	733.57	
	04N22W05H04S	06/04/2012	950.22	208.25	741.97	
	04N22W05L08S	06/04/2012	892.09	NM	-----	Pumping
	04N22W05M01S	06/04/2012	843.47	112.00	731.47	
	04N22W06D01S	06/04/2012	846.66	95.65	751.01	
	04N22W06D05S	06/04/2012	853.21	105.90	747.31	
	04N22W06K03S	06/07/2012	801.80	111.00	690.80	
	04N22W06K12S	06/04/2012	812.70	110.65	702.05	
	04N22W06M01S	06/04/2012	794.78	63.70	731.08	
	04N22W07B02S	06/07/2012	773.77	79.00	694.77	Recently Pumped
	04N22W07G01S	06/07/2012	771.20	32.40	738.80	Recently Pumped
	04N22W08B02S	06/07/2012	870.57	125.75	744.82	
	04N23W01K02S	06/04/2012	786.38	41.00	745.38	
	04N23W02K01S	06/04/2012	869.49	3.90	865.59	
	04N23W12H02S	06/13/2012	716.61	27.75	688.86	
	04N23W12L02S	06/13/2012	682.50	NM	-----	Inaccessible
	05N22W32J02S	06/07/2012	1,139.80	80.40	1,059.40	
Third Measure	04N22W04Q01S	10/04/2012	1,045.50	105.00	940.50	
	04N22W05D03S	09/25/2012	895.97	199.65	696.32	
	04N22W05H04S	09/18/2012	950.22	236.50	713.72	
	04N22W05L08S	10/04/2012	892.09	182.00	710.09	
	04N22W05M01S	09/18/2012	843.47	139.00	704.47	
	04N22W06D01S	09/17/2012	846.66	118.30	728.36	
	04N22W06D05S	09/17/2012	853.21	131.80	721.41	
	04N22W06K03S	09/25/2012	801.80	138.50	663.30	
	04N22W06K12S	09/18/2012	812.70	143.52	669.18	
	04N22W06M01S	09/17/2012	794.78	72.90	721.88	
	04N22W07B02S	09/24/2012	773.77	100.30	673.47	
	04N22W07G01S	09/24/2012	771.20	53.15	718.05	
	04N22W08B02S	09/28/2012	870.57	154.80	715.77	
	04N23W01K02S	09/17/2012	786.38	52.60	733.78	
	04N23W02K01S	09/17/2012	869.49	3.25	866.24	
	04N23W12H02S	09/26/2012	716.61	33.65	682.96	
	04N23W12L02S	09/17/2012	682.50	NM	-----	Tape Hung Up
	05N22W32J02S	09/26/2012	1,139.80	135.4	1004.4	
Fourth Measure	04N22W04Q01S	12/06/2012	1,045.50	98.60	946.90	
	04N22W05D03S	12/06/2012	895.97	188.90	707.07	
	04N22W05H04S	12/06/2012	950.22	230.70	719.52	
	04N22W05L08S	12/06/2012	892.09	177.30	714.79	
	04N22W05M01S	12/07/2012	843.47	138.45	705.02	
	04N22W06D01S	12/05/2012	846.66	121.60	725.06	
	04N22W06D05S	12/05/2012	853.21	137.10	716.11	
	04N22W06K03S	12/06/2012	801.80	105.00	696.80	
	04N22W06K12S	12/07/2012	812.70	119.70	693.00	
	04N22W06M01S	12/05/2012	794.78	80.40	714.38	
	04N22W07B02S	12/07/2012	773.77	70.90	702.87	
	04N22W07G01S	12/06/2012	771.20	55.90	715.30	
	04N22W08B02S	12/06/2012	870.57	143.90	726.67	
	04N23W01K02S	12/05/2012	786.38	31.30	755.08	
	04N23W02K01S	12/05/2012	869.49	2.55	866.94	
	04N23W12H02S	12/07/2012	716.61	33.4	683.21	
	04N23W12L02S	12/07/2012	682.50	NM	-----	Inaccessible
	05N22W32J02S	12/06/2012	1,139.80	60.30	1,079.50	

Appendix C – Groundwater Level Measurement Data

Oxnard Plain Forebay	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N21W07P04S	04/10/2012	138.78	110.85	27.93	
	02N22W11A01S	03/06/2012	133.44	64.50	68.94	
	02N22W26E01S	03/06/2012	86.96	40.90	46.06	

Oxnard Plain Forebay	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Second Measure	02N21W07P04S	06/05/2012	138.78	133.20	5.58	
	02N22W11A01S	06/18/2012	133.44	63.80	69.64	
	02N22W26E01S	06/21/2012	86.96	44.10	42.86	
Third Measure	02N21W07P04S	10/03/2012	138.78	149.25	-10.47	
	02N22W11A01S	09/05/2012	133.44	NM	-----	Pumping
	02N22W26E01S	09/21/2012	86.96	54.64	32.32	
Fourth Measure	02N21W07P04S	12/10/2012	138.78	128	10.78	
	02N22W11A01S	12/10/2012	133.44	82.70	50.74	
	02N22W26E01S	12/14/2012	86.96	58.40	28.56	

Oxnard Plain Pressure	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	01N21W04N02S	03/07/2012	43.33	78.90	-35.57	
	01N21W05A02S	03/07/2012	51.54	12.00	39.54	
	01N21W06L04S	03/06/2012	47.85	17.80	30.05	
	01N21W07H01S	03/06/2012	40.87	16.25	24.62	
	01N21W09C04S	03/07/2012	39.96	74.64	-34.68	
	01N21W16M01S	03/06/2012	22.79	60.21	-37.42	
	01N21W16P03S	03/06/2012	19.39	62.91	-43.52	
	01N21W17D02S	03/06/2012	28.21	10.39	17.82	
	01N21W20N07S	03/06/2012	16.98	NM	-----	Special
	01N21W21N01S	03/06/2012	15.74	45.90	-30.16	
	01N21W28D01S	03/06/2012	14.75	45.10	-30.35	
	01N21W29B03S	03/07/2012	18.19	13.99	4.20	
	01N21W32K01S	03/05/2012	10.00	35.00	-25.00	
	01N22W12N03S	03/07/2012	38.46	55.40	-16.94	
	01N22W12R01S	03/06/2012	34.00	46.10	-12.10	
	01N22W14K01S	03/06/2012	33.97	10.24	23.73	
	01N22W21B03S	03/06/2012	15.28	4.90	10.38	
	01N22W24C02S	03/06/2012	29.10	12.05	17.05	
	01N22W26K03S	03/07/2012	13.06	NM	-----	Pumping
	01N22W26M03S	03/07/2012	13.00	NM	-----	Pumping
	01N22W36B02S	03/07/2012	11.50	39.50	-28.00	
	02N21W18H03S	03/06/2012	118.41	NM	-----	Pumping
	02N21W18H12S	03/06/2012	117.88	NM	-----	Pumping
	02N21W19A03S	03/20/2012	102.70	73.25	29.45	
	02N21W19B02S	03/06/2012	101.80	40.88	60.92	
	02N21W20F02S	04/04/2012	113.36	110.30	3.06	
	02N21W20M06S	03/06/2012	92.09	NM	-----	Pumping
	02N21W31P02S	03/07/2012	57.75	18.85	38.90	
	02N21W31P03S	03/07/2012	55.17	94.60	-39.43	
	02N22W24P01S	03/06/2012	94.30	NM	-----	Pumping
	02N22W30K01S	03/06/2012	42.38	16.92	25.46	
	02N22W31A01S	03/06/2012	42.30	14.16	28.14	
	02N22W32Q03S	03/06/2012	40.10	11.20	28.90	
	02N23W25G02S	03/06/2012	23.22	-0.10	23.32	Flowing
	02N23W36C04S	03/06/2012	27.73	6.76	20.97	

Appendix C – Groundwater Level Measurement Data

Oxnard Plain Pressure	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
	01N21W04N02S	06/20/2012	43.33	90.90	-47.57	
	01N21W05A02S	06/19/2012	51.54	11.41	40.13	
	01N21W06L04S	06/19/2012	47.85	20.47	27.38	
	01N21W07H01S	06/19/2012	40.87	17.43	23.44	
	01N21W09C04S	06/20/2012	39.96	NM	-----	Special
	01N21W16M01S	06/19/2012	22.79	73.00	-50.21	
	01N21W16P03S	06/19/2012	19.39	70.29	-50.90	
	01N21W17D02S	06/19/2012	28.21	11.20	17.01	
	01N21W20N07S	06/19/2012	16.98	NM	-----	Special
	01N21W21N01S	06/19/2012	15.74	41.90	-26.16	
	01N21W28D01S	06/19/2012	14.75	60.00	-45.25	
	01N21W29B03S	06/19/2012	18.19	NM	-----	Pumping
	01N21W32K01S	05/07/2012	10.00	34.00	-24.00	
	01N21W32K01S	06/18/2012	10.00	47.00	-37.00	
	01N22W12N03S	06/20/2012	38.46	55.60	-17.14	
	01N22W12R01S	06/19/2012	34.00	NM	-----	Special
	01N22W14K01S	06/19/2012	33.97	11.30	22.67	
Second Measure	01N22W21B03S	06/19/2012	15.28	6.35	8.93	
	01N22W24C02S	06/19/2012	29.10	13.89	15.21	
	01N22W26K03S	06/19/2012	13.06	38.90	-25.84	
	01N22W26M03S	06/19/2012	13.00	34.36	-21.36	
	01N22W36B02S	06/19/2012	11.50	35.70	-24.20	
	02N21W18H03S	06/21/2012	118.41	NM	-----	Pumping
	02N21W18H12S	06/21/2012	117.88	NM	-----	Pumping
	02N21W19A03S	06/06/2012	102.70	80.18	22.52	
	02N21W19B02S	06/21/2012	101.80	54.90	46.90	
	02N21W20F02S	06/06/2012	113.36	120.02	-6.66	
	02N21W20M06S	06/21/2012	92.09	114.90	-22.81	
	02N21W31P02S	06/19/2012	57.75	21.85	35.90	
	02N21W31P03S	06/19/2012	55.17	NM	-----	Pumping
	02N22W24P01S	06/21/2012	94.30	NM	-----	Pumping
	02N22W30K01S	06/19/2012	42.38	19.42	22.96	
	02N22W31A01S	06/19/2012	42.30	16.48	25.82	
	02N22W32Q03S	06/20/2012	40.10	13.40	26.70	
	02N23W25G02S	06/19/2012	23.22	-0.10	23.32	Flowing

Appendix C – Groundwater Level Measurement Data

Oxnard Plain Pressure	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Third Measure	01N21W04N02S	09/11/2012	43.33	130.85	-87.52	
	01N21W05A02S	09/11/2012	51.54	15.98	35.56	
	01N21W06L04S	09/11/2012	47.85	28.50	19.35	
	01N21W07H01S	09/11/2012	40.87	22.98	17.89	
	01N21W09C04S	09/11/2012	39.96	NM	-----	Special
	01N21W16M01S	09/11/2012	22.79	123.26	-100.47	Recently Pumped
	01N21W16P03S	09/11/2012	19.39	90.90	-71.51	
	01N21W17D02S	09/11/2012	28.21	15.60	12.61	
	01N21W20N07S	09/11/2012	16.98	NM	-----	Special
	01N21W21N01S	09/11/2012	15.74	73.40	-57.66	Recently Pumped
	01N21W28D01S	09/11/2012	14.75	NM	-----	Pumping
	01N21W29B03S	09/11/2012	18.19	17.50	0.69	
	01N21W32K01S	09/10/2012	10.00	77.00	-67.00	
	01N22W12N03S	09/05/2012	38.46	74.01	-35.55	
	01N22W12R01S	09/12/2012	34.00	NM	-----	Pumping
	01N22W14K01S	09/05/2012	33.97	19.51	14.46	
	01N22W21B03S	09/05/2012	15.28	13.37	1.91	
	01N22W24C02S	09/05/2012	29.10	21.01	8.09	
	01N22W26K03S	09/05/2012	13.06	NM	-----	Pumping
	01N22W26M03S	09/11/2012	13.00	61	-48	
	01N22W36B02S	09/05/2012	11.50	NM	-----	Pumping
	02N21W18H03S	09/12/2012	118.41	NM	-----	Pumping
	02N21W18H12S	09/12/2012	117.88	NM	-----	Pumping
	02N21W19A03S	09/24/2012	102.70	87.73	14.97	
	02N21W19B02S	09/12/2012	101.80	NM	-----	Special
	02N21W20F02S	09/24/2012	113.36	133.80	-20.44	
	02N21W20M06S	09/11/2012	92.09	NM	-----	Pumping
	02N21W31P02S	09/11/2012	57.75	31.29	26.46	
	02N21W31P03S	09/11/2012	55.17	112.50	-57.33	
	02N22W24P01S	09/12/2012	94.30	NM	-----	Pumping
	02N22W30K01S	09/05/2012	42.38	25.76	16.62	
	02N22W31A01S	09/05/2012	42.30	25.90	16.40	
	02N22W32Q03S	09/05/2012	40.10	22.10	18.00	
	02N23W25G02S	09/05/2012	23.22	11.59	11.63	
	02N23W36C04S	09/05/2012	27.73	15.13	12.60	

Appendix C – Groundwater Level Measurement Data

Oxnard Plain Pressure	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Fourth Measure	01N21W04N02S	12/11/2012	43.33	103.71	-60.38	
	01N21W05A02S	12/11/2012	51.54	16.68	34.86	
	01N21W06L04S	12/11/2012	47.85	29.55	18.30	
	01N21W07H01S	12/11/2012	40.87	24.52	16.35	
	01N21W09C04S	12/12/2012	39.96	NM	-----	Special
	01N21W16M01S	12/11/2012	22.79	83.15	-60.36	
	01N21W16P03S	12/11/2012	19.39	78.61	-59.22	
	01N21W17D02S	12/11/2012	28.21	18.34	9.87	
	01N21W20N07S	12/11/2012	16.98	NM	-----	Special
	01N21W21N01S	12/11/2012	15.74	55.69	-39.95	
	01N21W28D01S	12/11/2012	14.75	69.80	-55.05	
	01N21W29B03S	12/11/2012	18.19	16.40	1.79	
	01N21W32K01S	12/10/2012	10.00	61.00	-51.00	
	01N22W12N03S	12/11/2012	38.46	65.45	-26.99	
	01N22W12R01S	12/12/2012	34.00	NM	-----	Special
	01N22W14K01S	12/11/2012	33.97	20.93	13.04	
	01N22W21B03S	12/11/2012	15.28	13.71	1.57	
	01N22W24C02S	12/11/2012	29.10	21.22	7.88	
	01N22W26K03S	12/11/2012	13.06	43.20	-30.14	
	01N22W26M03S	12/11/2012	13.00	39.95	-26.95	
	01N22W36B02S	12/11/2012	11.50	38.60	-27.10	
	02N21W18H03S	12/14/2012	118.41	72	46.41	
	02N21W18H12S	12/14/2012	117.88	90	27.88	
	02N21W19A03S	12/10/2012	102.70	75.90	26.80	
	02N21W19B02S	12/14/2012	101.80	60.00	41.80	
	02N21W20F02S	12/10/2012	113.36	125.83	-12.47	
	02N21W20M06S	12/14/2012	92.09	102.9	-10.81	
	02N21W31P02S	12/11/2012	57.75	33.00	24.75	
	02N21W31P03S	12/11/2012	55.17	104.00	-48.83	
	02N22W24P01S	12/12/2012	94.30	67.50	26.80	
	02N22W30K01S	12/11/2012	42.38	24.00	18.38	
	02N22W31A01S	12/11/2012	42.30	20.75	21.55	
	02N22W32Q03S	12/11/2012	40.10	18	22.1	
	02N23W25G02S	12/11/2012	23.22	5.50	17.72	
	02N23W36C04S	12/11/2012	27.73	12.00	15.73	

Appendix C – Groundwater Level Measurement Data

Piru	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	04N18W19R01S	03/05/2012	655.63	87.50	568.13	
	04N18W20R01S	03/12/2012	661.29	72.30	588.99	
	04N18W28C02S	03/05/2012	676.44	90.69	585.75	
	04N19W25C02S	03/05/2012	611.09	71.23	539.86	
	04N19W25K04S	03/09/2012	593.97	37.00	556.97	
	04N19W26P01S	03/09/2012	563.00	33.80	529.20	
	04N19W34K01S	03/05/2012	519.51	10.64	508.87	
	04N19W35L02S	03/05/2012	541.08	16.20	524.88	
Second Measure	04N18W19R01S	06/18/2012	655.63	NM	-----	Pumping
	04N18W20R01S	06/18/2012	661.29	NM	-----	Pumping
	04N18W28C02S	06/18/2012	676.44	NM	-----	Pumping
	04N19W25C02S	06/18/2012	611.09	75.11	535.98	
	04N19W25K04S	06/18/2012	593.97	NM	-----	Pumping
	04N19W26P01S	06/18/2012	563.00	36.90	526.10	
	04N19W34K01S	06/18/2012	519.51	13.62	505.89	
	04N19W35L02S	06/18/2012	541.08	20.19	520.89	
Third Measure	04N18W19R01S	09/04/2012	655.63	104.30	551.33	
	04N18W20R01S	09/13/2012	661.29	93.40	567.89	
	04N18W28C02S	09/13/2012	676.44	109.8	566.64	
	04N19W25C02S	09/04/2012	611.09	83.60	527.49	
	04N19W25K04S	09/04/2012	593.97	NM	-----	Pumping
	04N19W26P01S	09/04/2012	563.00	NM	-----	Pumping
	04N19W34K01S	09/04/2012	519.51	17.85	501.66	
	04N19W35L02S	09/04/2012	541.08	25.82	515.26	
Fourth Measure	04N18W19R01S	12/10/2012	655.63	94.55	561.08	
	04N18W20R01S	12/10/2012	661.29	90.55	570.74	
	04N18W28C02S	12/10/2012	676.44	NM	-----	Pumping
	04N19W25C02S	12/10/2012	611.09	77.70	533.39	
	04N19W25K04S	12/10/2012	593.97	37.36	556.61	
	04N19W26P01S	12/10/2012	563.00	34.95	528.05	
	04N19W34K01S	12/10/2012	519.51	5.82	513.69	
	04N19W35L02S	12/10/2012	541.08	17.31	523.77	
Pleasant Valley	**SWN**	**Date**	**RP**	**Depth Below RP**	**Elev. Above MSL**	**Note**
First Measure	01N21W02J02S	03/07/2012	89.51	57.90	31.61	
	01N21W02P01S	03/07/2012	67.98	66.15	1.83	
	01N21W03C01S	03/07/2012	72.28	91.78	-19.50	
	01N21W04K01S	03/07/2012	47.52	74.50	-26.98	
	01N21W09J03S	03/08/2012	30.56	59.50	-28.94	
	01N21W10G01S	03/07/2012	38.72	64.60	-25.88	
	01N21W14A01S	03/07/2012	50.11	7.65	42.46	
	01N21W15H01S	03/07/2012	33.17	0.60	32.57	
	01N21W16A04S	03/07/2012	25.69	58.90	-33.21	
	02N20W19M05S	03/08/2012	200.47	109.25	91.22	
	02N20W28G02S	03/06/2012	170.60	NM	-----	Special
	02N21W33P02S	03/07/2012	64.63	51.9	12.73	
	02N21W35M02S	03/07/2012	90.60	120.89	-30.29	
	02N21W36N01S	03/07/2012	111.18	58.70	52.48	
	02N21W36N01S	03/14/2011	111.18	65.95	45.23	

Appendix C – Groundwater Level Measurement Data

Pleasant Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Second Measure	01N21W02J02S	06/20/2012	89.51	54.70	34.81	
	01N21W02P01S	06/20/2012	67.98	84.70	-16.72	
	01N21W03C01S	06/20/2012	72.28	113.00	-40.72	
	01N21W04K01S	06/19/2012	47.52	NM	-----	Tape Hung Up
	01N21W09J03S	06/25/2012	30.56	83.60	-53.04	
	01N21W10G01S	06/19/2012	38.72	92.50	-53.78	
	01N21W14A01S	06/20/2012	50.11	NM	-----	Special
	01N21W15H01S	06/20/2012	33.17	2.07	31.10	
	01N21W16A04S	06/20/2012	25.69	70.27	-44.58	
	02N20W19M05S	06/20/2012	200.47	114.90	85.57	
	02N20W28G02S	06/20/2012	170.60	NM	-----	Special
	02N21W33P02S	06/19/2012	64.63	73.7	-9.07	
	02N21W35M02S	06/20/2012	90.60	130.70	-40.10	
	02N21W36N01S	06/20/2012	111.18	70.11	41.07	
	02N21W36N01S	06/09/2011	111.18	55.50	55.68	
Third Measure	01N21W02J02S	09/11/2012	89.51	79.50	10.01	
	01N21W02P01S	09/11/2012	67.98	119.90	-51.92	
	01N21W03C01S	09/11/2012	72.28	137.70	-65.42	
	01N21W04K01S	09/11/2012	47.52	123.00	-75.48	
	01N21W09J03S	09/21/2012	30.56	129.00	-98.44	Recently Pumped
	01N21W10G01S	09/11/2012	38.72	NM	-----	Pumping
	01N21W14A01S	09/11/2012	50.11	NM	-----	Special
	01N21W15H01S	09/11/2012	33.17	3.75	29.42	
	01N21W16A04S	09/21/2012	25.69	120.60	-94.91	Recently Pumped
	02N20W19M05S	09/11/2012	200.47	113.30	87.17	
	02N20W28G02S	09/12/2012	170.60	NM	-----	Special
	02N21W33P02S	09/11/2012	64.63	101.30	-36.67	
	02N21W35M02S	09/12/2012	90.60	156.43	-65.83	
	02N21W36N01S	09/11/2012	111.18	77.40	33.78	
Fourth Measure	01N21W02J02S	12/11/2012	89.51	75.89	13.62	
	01N21W02P01S	12/12/2012	67.98	95.80	-27.82	
	01N21W03C01S	12/11/2012	72.28	116.90	-44.62	
	01N21W04K01S	12/11/2012	47.52	103.20	-55.68	
	01N21W09J03S	12/13/2012	30.56	80.30	-49.74	
	01N21W10G01S	12/12/2012	38.72	93.00	-54.28	
	01N21W14A01S	12/12/2012	50.11	NM	-----	Special
	01N21W15H01S	12/12/2012	33.17	5.18	27.99	
	01N21W16A04S	12/12/2012	25.69	82.00	-56.31	
	02N20W19M05S	12/12/2012	200.47	113.80	86.67	
	02N20W28G02S	12/12/2012	170.60	NM	-----	Special
	02N21W33P02S	12/11/2012	64.63	88	-23.37	
	02N21W35M02S	12/11/2012	90.60	148.70	-58.10	
	02N21W36N01S	12/11/2012	111.18	72.05	39.13	
	02N21W36N01S	12/07/2011	111.18	62.90	48.28	

Appendix C – Groundwater Level Measurement Data

Santa Paula	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N22W02C01S	03/05/2012	184.38	35.07	149.31	
	02N22W03K02S	03/06/2012	248.75	117.50	131.25	
	02N22W03M02S	03/06/2012	291.50	187.20	104.30	
	03N21W09K02S	03/06/2012	362.18	172.9	189.28	
	03N21W17Q01S	03/05/2012	283.35	0.00	283.35	
	03N21W19R01S	03/06/2012	235.39	65.36	170.03	
	03N22W36K05S	03/06/2012	180.89	30.09	150.80	
Second Measure	02N22W02C01S	06/18/2012	184.38	36.5	147.88	
	02N22W03K02S	06/18/2012	248.75	117.50	131.25	
	02N22W03M02S	06/18/2012	291.50	187.90	103.60	
	03N21W09K02S	06/18/2012	362.18	174.70	187.48	
	03N21W17Q01S	06/18/2012	283.35	105.16	178.19	
	03N21W19R01S	06/18/2012	235.39	NM	-----	Pumping
	03N22W36K05S	06/18/2012	180.89	35	145.89	
Third Measure	02N22W02C01S	09/14/2012	184.38	39.10	145.28	
	02N22W03K02S	09/05/2012	248.75	121.71	127.04	
	02N22W03M02S	09/05/2012	291.50	191.20	100.30	
	03N21W09K02S	09/13/2012	362.18	187.20	174.98	
	03N21W17Q01S	09/04/2012	283.35	106.30	177.05	
	03N21W19R01S	09/13/2012	235.39	72.6	162.79	
	03N22W36K05S	09/05/2012	180.89	34.20	146.69	
Fourth Measure	02N22W02C01S	12/10/2012	184.38	37.10	147.28	
	02N22W03K02S	12/11/2012	248.75	124.10	124.65	
	02N22W03M02S	12/11/2012	291.50	196.40	95.10	
	03N21W09K02S	12/10/2012	362.18	171.3	190.88	
	03N21W17Q01S	12/10/2012	283.35	99.25	184.10	
	03N21W19R01S	12/10/2012	235.39	65.10	170.29	
	03N22W36K05S	12/10/2012	180.89	33.20	147.69	

Sherwood	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	01N19W19L02S	03/19/2012	1,082.00	216.80	865.20	
	01N19W30A01S	03/19/2012	999.98	33.50	966.48	
Second Measure	01N19W19L02S	06/05/2012	1,082.00	227.30	854.70	
	01N19W30A01S	06/05/2012	999.98	36.90	963.08	
Third Measure	01N19W19L02S	10/01/2012	1,082.00	NM	-----	Pumping
	01N19W30A01S	10/01/2012	999.98	44.80	955.18	
Fourth Measure	01N19W19L02S	12/20/2012	1,082.00	288.80	793.20	
	01N19W30A01S	12/20/2012	999.98	41.80	958.18	

Appendix C – Groundwater Level Measurement Data

Simi Valley	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	02N18W04R02S	03/08/2012	870.00	46.80	823.20	
	02N18W10A02S	03/08/2012	926.40	71.60	854.80	
Second Measure	02N18W04R02S	06/21/2012	870.00	42.90	827.10	
	02N18W10A02S	06/01/2012	926.40	70.00	856.40	
Third Measure	02N18W04R02S	09/12/2012	870.00	45.90	824.10	
	02N18W10A02S	09/17/2012	926.40	71.20	855.20	
Fourth Measure	02N18W04R02S	12/12/2012	870.00	48.80	821.20	
	02N18W10A02S	12/17/2012	926.40	76.60	849.80	
Thousand Oaks	**SWN**	**Date**	**RP**	**Depth Below RP**	**Elev. Above MSL**	**Note**
First Measure	01N19W14K04S	04/10/2012	908.79	22.40	886.39	
Second Measure	01N19W14K04S	06/05/2012	908.79	22.50	886.29	
Third Measure	01N19W14K04S	10/01/2012	908.79	23.83	884.96	
Fourth Measure	01N19W14K04S	12/20/2012	908.79	24.5	884.29	
Tierra Rejada	**SWN**	**Date**	**RP**	**Depth Below RP**	**Elev. Above MSL**	**Note**
First Measure	02N19W10R01S	03/08/2012	619.29	94.40	524.89	
	02N19W12M03S	03/08/2012	718.95	85.00	633.95	
	02N19W14P01S	03/08/2012	678.12	31.26	646.86	
Second Measure	02N19W10R01S	06/21/2012	619.29	95.00	524.29	
	02N19W12M03S	06/21/2012	718.95	85.16	633.79	
	02N19W14P01S	06/21/2012	678.12	31.15	646.97	
Third Measure	02N19W10R01S	09/12/2012	619.29	100.24	519.05	
	02N19W12M03S	09/13/2012	718.95	85.90	633.05	
	02N19W14P01S	09/12/2012	678.12	31.89	646.23	
Fourth Measure	02N19W10R01S	12/12/2012	619.29	99.90	519.39	
	02N19W12M03S	12/12/2012	718.95	86.00	632.95	
	02N19W14P01S	12/12/2012	678.12	32.59	645.53	
Undefined	**SWN**	**Date**	**RP**	**Depth Below RP**	**Elev. Above MSL**	**Note**
First Measure	01N19W15E01S	03/19/2012	903.53	24.55	878.98	
	01N20W24H02S	03/19/2012	1,126.54	98.00	1,028.54	
	02N21W13A01S	03/21/2012	440.00	532.60	-92.60	
Second Measure	01N19W15E01S	06/05/2012	903.53	24.20	879.33	
	01N20W24H02S	06/05/2012	1,126.54	NM	-----	Special
	02N21W13A01S	06/06/2012	440.00	534.90	-94.90	
Third Measure	01N19W15E01S	10/01/2012	903.53	26.25	877.28	
	01N20W24H02S	10/01/2012	1,126.54	108.90	1,017.64	
	02N21W13A01S	10/05/2012	440.00	548.90	-108.90	
	04N22W21F01S	09/25/2012	2,570.00	151.00	2,419.00	
	04N22W22K01S	09/25/2012	2,400.00	247.40	2,152.60	
Fourth Measure	01N19W15E01S	12/20/2012	903.53	25.47	878.06	
	01N20W24H02S	12/20/2012	1,126.54	119	1007.54	
	02N21W13A01S	12/17/2012	440.00	528	-88	

Appendix C – Groundwater Level Measurement Data

Upper Ojai	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	04N22W09Q02S	04/10/2012	1,278.80	20.00	1,258.80	
	04N22W10K02S	03/16/2012	1,325.90	22.80	1,303.10	
	04N22W11P02S	03/16/2012	1,420.60	18.80	1,401.80	
	04N22W12F04S	03/16/2012	1,616.90	140.10	1,476.80	
Second Measure	04N22W09Q02S	06/13/2012	1,278.80	22.33	1,256.47	
	04N22W10K02S	06/13/2012	1,325.90	26.45	1,299.45	
	04N22W11P02S	06/13/2012	1,420.60	22.25	1,398.35	
	04N22W12F04S	06/13/2012	1,616.90	142.3	1474.6	
Third Measure	04N22W09Q02S	09/28/2012	1,278.80	26.65	1,252.15	
	04N22W10K02S	09/28/2012	1,325.90	41.00	1,284.90	
	04N22W11P02S	09/25/2012	1,420.60	23.76	1,396.84	
	04N22W12F04S	10/04/2012	1,616.90	160.6	1456.3	
Fourth Measure	04N22W09Q02S	12/07/2012	1,278.80	24.25	1254.55	
	04N22W10K02S	12/07/2012	1,325.90	23.70	1,302.20	
	04N22W11P02S	12/07/2012	1,420.60	22.50	1,398.10	
	04N22W12F04S	12/07/2012	1,616.90	150.20	1,466.70	

Lower Ventura River	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	03N23W08B07S	03/13/2012	239.19	14.70	224.49	
	03N23W32Q03S	04/10/2012	50.86	27.70	23.20	
	03N23W32Q07S	04/10/2012	46.10	22.66	23.40	
Second Measure	03N23W08B07S	06/07/2012	239.19	15.00	224.19	
	03N23W32Q03S	06/13/2012	50.86	32.46	18.40	Nearby Pumping
	03N23W32Q07S	06/13/2012	46.10	26.80	19.30	
Third Measure	03N23W08B07S	09/17/2012	239.19	15.44	223.75	
Fourth Measure	03N23W08B07S	12/04/2012	239.19	16.86	222.33	

Upper Ventura River	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
First Measure	03N23W05B01S	03/13/2012	293.20	28.32	264.88	
	03N23W08B02S	03/13/2012	249.30	16.20	233.10	
	04N23W03M01S	03/15/2012	760.85	97.80	663.05	
	04N23W04J01S	03/23/2012	713.04	47.39	665.65	
	04N23W09B01S	03/15/2012	662.30	40.50	621.80	
	04N23W14M04S	03/29/2012	554.50	-0.1	554.60	Flowing
	04N23W15A02S	03/15/2012	680.90	83.25	597.65	
	04N23W15D02S	03/15/2012	634.30	117.90	516.40	
	04N23W16C04S	03/13/2012	569.10	44.66	524.44	
	04N23W16P01S	03/13/2012	619.89	66.75	553.14	
	04N23W20A01S	03/13/2012	488.89	18.4	470.49	
	04N23W28G01S	03/29/2012	402.37	9.73	392.64	
	04N23W29F02S	03/13/2012	396.58	27.80	368.78	
	04N23W33M03S	03/13/2012	331.80	14.10	317.70	
	04N24W13J04S	03/13/2012	626.45	7.65	618.80	
	04N24W13N01S	03/13/2012	642.12	0.5	641.62	
	05N23W33B03S	03/23/2012	829.00	23.55	805.45	
	05N23W33G01S	03/29/2012	816.21	21.12	795.09	

Appendix C – Groundwater Level Measurement Data

Upper Ventura River	SWN	Date	RP	Depth Below RP	Elev. Above MSL	Note
Second Measure	03N23W05B01S	06/07/2012	293.20	29.40	263.80	
	03N23W08B02S	06/07/2012	249.30	15.24	234.06	
	04N23W03M01S	06/07/2012	760.85	97.20	663.65	
	04N23W04J01S	06/07/2012	713.04	65.35	647.69	
	04N23W09B01S	06/07/2012	662.30	42.70	619.60	
	04N23W14M04S	06/13/2012	554.50	-0.1	554.60	Flowing
	04N23W15A02S	06/04/2012	680.90	82.3	598.6	
	04N23W15D02S	06/07/2012	634.30	114.80	519.50	
	04N23W16C04S	06/04/2012	569.10	41.30	527.80	
	04N23W16P01S	06/04/2012	619.89	66.80	553.09	
	04N23W20A01S	06/07/2012	488.89	13.28	475.61	
	04N23W28G01S	06/13/2012	402.37	17.40	384.97	
	04N23W29F02S	06/07/2012	396.58	21.30	375.28	
	04N23W33M03S	06/07/2012	331.80	14.85	316.95	
	04N24W13J04S	06/07/2012	626.45	7.00	619.45	
	04N24W13N01S	06/07/2012	642.12	1.1	641.02	
	05N23W33B03S	06/13/2012	829.00	27.90	801.10	
	05N23W33G01S	06/07/2012	816.21	22.85	793.36	
Third Measure	03N23W05B01S	09/17/2012	293.20	33.40	259.80	
	03N23W08B02S	09/17/2012	249.30	19.00	230.30	
	04N23W03M01S	09/18/2012	760.85	100.00	660.85	
	04N23W04J01S	09/18/2012	713.04	71.50	641.54	
	04N23W09B01S	09/18/2012	662.30	84.70	577.60	
	04N23W14M04S	09/18/2012	554.50	-0.1	554.60	Flowing
	04N23W15A02S	09/17/2012	680.90	85.35	595.55	
	04N23W15D02S	09/17/2012	634.30	134.09	500.21	
	04N23W16C04S	09/17/2012	569.10	74.80	494.30	Nearby Pumping
	04N23W16P01S	09/17/2012	619.89	67.30	552.59	
	04N23W20A01S	09/28/2012	488.89	47.40	441.49	
	04N23W28G01S	09/18/2012	402.37	26.60	375.77	
	04N23W29F02S	09/17/2012	396.58	44.80	351.78	
	04N23W33M03S	09/17/2012	331.80	19.55	312.25	
	04N24W13J04S	09/17/2012	626.45	13.65	612.80	
	04N24W13N01S	09/17/2012	642.12	3.1	639.02	
	05N23W33B03S	09/18/2012	829.00	32.50	796.50	
	05N23W33G01S	09/18/2012	816.21	25.30	790.91	
Fourth Measure	03N23W05B01S	12/04/2012	293.20	39.45	253.75	
	03N23W08B02S	12/10/2012	249.30	82.25	167.05	
	04N23W03M01S	12/05/2012	760.85	100.90	659.95	
	04N23W04J01S	12/06/2012	713.04	64	649.04	
	04N23W09B01S	12/05/2012	662.30	62.65	599.65	
	04N23W14M04S	12/06/2012	554.50	NM	-----	Inaccessible
	04N23W15A02S	12/04/2012	680.90	84.70	596.20	
	04N23W15D02S	12/04/2012	634.30	145.35	488.95	
	04N23W16C04S	12/04/2012	569.10	75.40	493.70	
	04N23W16P01S	12/04/2012	619.89	68.10	551.79	
	04N23W20A01S	12/04/2012	488.89	27.90	460.99	
	04N23W28G01S	12/06/2012	402.37	17.50	384.87	
	04N23W29F02S	12/04/2012	396.58	54.70	341.88	
	04N23W33M03S	12/04/2012	331.80	14.40	317.40	
	04N24W13J04S	12/10/2012	626.45	2.90	623.55	
	04N24W13N01S	12/10/2012	642.12	3.4	638.72	
	05N23W33B03S	12/06/2012	829.00	23.35	805.65	
	05N23W33G01S	12/10/2012	816.21	21.30	794.91	

Appendix D – Water Quality Section

TABLES | Page

General Minerals

Constituents

B – Boron (mg/l)
HCO_3^- – Bicarbonate (mg/l)
Ca – Calcium (mg/l)
Cu – Copper (µg/l)
CO_3^{2-} – Carbonate (mg/l)
Cl^- – Chloride (mg/l)
eC – Electrical Conductivity *(µmhos/cm)*
F^- – Fluoride (mg/l)
Fe – Iron (µg/l)
K – Potassium (mg/l)
Mg – Magnesium (mg/l)
Mn – Manganese (µg/l)
NO_3^- – Nitrate (mg/l)
Na – Sodium (mg/l)
SO_4^{2-} – Sulfate (mg/l)
TDS – Total Dissolved Solids (mg/l)
Zn – Zinc (µg/l)
pH *(units)*

Laboratory Analytical Methods

Chemical Constituent	Method
B, Ca, Cu, Fe, K, Mg, Mn, Na, Z, TDS by Summation	EPA 200.7
CO_3^{2-}, HCO_3^- ,	SM23320B
Cl^-, F^- , SO_4^{2-},	EPA 300.0
NO^{3-},	SM4500NO3F
pH	SM4500-H B
eC	SM2510B

Table D-1 General Minerals

GW Basin	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	02N19W19P02S	08/24/2012	0.2	340	69	ND	96	ND	1150	0.1	ND	1	67	ND	77.2	67	107	824	ND	7.6
Arroyo Santa Rosa	02N20W23G03S	09/04/2012	0.2	310	54	ND	118	ND	1110	ND	ND	1	58	ND	57.2	75	77	750	20	7.4
Arroyo Santa Rosa	02N20W23R01S	08/24/2012	0.3	330	95	ND	174	ND	1570	0.1	ND	1	75	ND	95	124	204	1100	ND	7.1
Arroyo Santa Rosa	02N20W24Q03S	08/24/2012	0.2	420	96	ND	140	ND	1560	ND	ND	2	94	ND	112	92	171	1130	ND	7.3
Arroyo Santa Rosa	02N20W25C02S	08/24/2012	0.2	420	100	ND	143	ND	1540	ND	ND	1	89	ND	94	95	177	1120	ND	7.4
Arroyo Santa Rosa	02N20W25C06S	08/24/2012	0.3	270	69	ND	141	ND	1240	0.1	ND	1	57	ND	24.2	105	175	842	ND	7.4
Arroyo Santa Rosa	02N20W25D01S	08/24/2012	0.2	330	80	ND	137	10	1350	ND	ND	1	74	ND	52.4	91	179	944	ND	7.7
Arroyo Santa Rosa	02N20W26C02S	09/12/2012	0.4	400	102	ND	175	ND	1730	ND	ND	1	80	ND	113	138	215	1220	ND	7.3
Cuyama Valley	07N23W15P01S	09/27/2012	0.2	210	283	ND	9	ND	2280	1	140	4	129	ND	3.1	99	1330	2070	ND	7.3
Cuyama Valley	08N24W17G02S	09/27/2012	0.4	280	17	ND	122	ND	1240	0.2	360	2	2	30	ND	248	197	868	30	8.2
Cuyama Valley	09N23W30E05S	09/27/2012	0.4	380	62	ND	103	ND	1270	1	750	2	10	20	5.4	200	174	937	ND	7.3
Cuyama Valley	09N24W25J01S	09/27/2012	0.4	380	54	ND	79	ND	1180	1.1	ND	2	10	ND	5.7	192	172	896	ND	7.3
Fillmore	03N19W06C03S	08/22/2012	1.2	ND	289	ND	97	ND	2390	0.3	ND	7	88	ND	135	161	900	1680	ND	7.4
Fillmore	03N20W01D03S	08/22/2012	0.6	270	135	ND	61	ND	1390	0.6	ND	5	51	ND	13.2	99	440	1070	30	7.4
Fillmore	03N20W01F05S	08/22/2012	0.6	270	142	ND	59	20	1420	0.7	ND	5	52	ND	18.8	100	470	1120	80	7.4
Fillmore	03N20W02R05S	11/06/2012	1.4	400	344	ND	180	ND	2970	0.5	ND	10	102	20	47.8	268	1080	2430	ND	7.3
Fillmore	03N21W01P08S	08/20/2012	0.4	360	182	ND	52	ND	1780	0.2	ND	3	52	590	53.6	163	610	1480	80	7.0
Fillmore	04N19W29R04S	09/04/2012	0.4	250	125	ND	46	ND	1400	0.6	ND	4	51	ND	6.8	11	490	1080	ND	7.4
Fillmore	04N19W31F01S	08/20/2012	0.6	260	133	ND	66	ND	1380	0.4	ND	5	52	ND	9.8	95	450	1070	30	7.4
Fillmore	04N20W13P03S	09/14/2012	1	260	138	ND	52	ND	1240	0.5	ND	3	36	ND	12.9	75	360	937	ND	7.2
Fillmore	04N20W32R03S	11/06/2012	0.3	280	171	ND	41	ND	1370	0.4	ND	3	38	20	45.2	88	390	1060	ND	7.8
Fillmore	04N20W34H01S	08/22/2012	0.6	280	167	ND	51	200	1350	0.3	1500	3	40	40	39.2	75	400	1060	260	7.3
Fillmore	04N20W36D07S	08/22/2012	0.7	310	165	ND	59	ND	1600	0.6	1900	5	64	130	12.4	107	560	1280	ND	7.3
Gillibrand/Tapo	03N18W24C07S	08/29/2012	0.2	280	140	ND	26	10	1050	0.2	ND	3	31	ND	22.7	42	290	835	ND	7.2
Gillibrand/Tapo	03N18W24H07S	08/29/2012	0.3	350	147	ND	27	ND	1120	0.1	640	3	34	80	0.5	50	292	904	ND	7.1
Las Posas - East	02N20W09Q07S	08/14/2012	1	260	211	ND	200	ND	2190	0.2	ND	5	69	250	16.5	205	730	1700	ND	7.4
Las Posas - East	02N20W10G01S	08/22/2012	0.8	310	177	ND	160	ND	2110	ND	ND	6	58	50	51.7	201	620	1580	ND	7.3
Las Posas - East	02N20W16B06S	10/30/2012	0.8	260	143	ND	171	ND	1920	0.4	110	6	58	60	2.9	196	550	1390	ND	6.9
Las Posas - East	03N19W29K06S	08/14/2012	ND	90	49	ND	43	40	491	0.1	ND	1	8	ND	73.6	33	27	325	ND	6.8
Las Posas - East	03N19W29K07S	08/14/2012	0.2	210	89	ND	35	ND	765	0.1	ND	3	15	ND	12.3	54	151	569	ND	7.4
Las Posas - East	03N20W28J04S	08/22/2012	0.2	240	58	ND	38	ND	843	0.5	ND	3	29	ND	46.7	72	131	618	30	7.5
Las Posas - East	03N20W34G01S	08/14/2012	ND	190	67	ND	10	ND	568	0.1	450	3	16	130	ND	30	112	428	ND	7.5
Las Posas - South	02N19W07B02S	08/14/2012	1	270	117	ND	158	ND	1850	0.4	ND	4	51	10	1.8	240	520	1360	ND	7.3
Las Posas - South	02N19W07D02S	08/22/2012	0.9	310	152	ND	149	ND	1800	0.2	ND	3	40	ND	18.4	192	450	1310	ND	7.2
Las Posas - South	02N19W08G01S	08/29/2012	0.7	230	141	ND	155	ND	1680	0.3	ND	4	42	ND	22.5	179	480	1250	ND	7.7

Table D-1 General Minerals (cont.)

GW Basin	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 - South	02N20W01Q01S	08/22/2012	0.8	310	163	ND	148	ND	1810	0.2	ND	3	46	ND	44.6	171	450	1340	ND	7.2
Las Posas - South	02N20W01Q02S	08/14/2012	1	270	144	ND	165	ND	1960	0.3	ND	5	51	ND	12.3	245	570	1460	ND	7.4
Las Posas - West	02N20W06J01S	08/30/2012	0.2	290	88	ND	17	ND	921	0.2	340	5	32	160	ND	62	233	727	ND	7.5
Las Posas - West	02N20W07R02S	08/30/2012	0.1	180	51	ND	11	ND	481	0.2	120	2	12	70	ND	32	76	364	ND	7.8
Las Posas - West	02N21W09D02S	08/14/2012	0.2	270	87	ND	85	ND	991	0.2	ND	3	31	20	27.5	82	130	716	ND	7.2
Las Posas - West	02N21W11A02S	08/14/2012	0.2	230	195	ND	116	ND	1740	0.3	ND	3	64	ND	175	97	430	1310	ND	7.2
Las Posas - West	02N21W11A03S	08/14/2012	0.2	300	78	ND	31	ND	925	0.1	230	6	32	60	ND	81	186	714	ND	7.7
Las Posas - West	02N21W12H01S	08/30/2012	0.2	240	94	ND	50	ND	975	0.1	140	4	30	70	ND	70	246	734	ND	7.5
Las Posas - West	02N21W15M04S	08/14/2012	0.4	280	103	ND	66	ND	1310	ND	ND	6	37	60	10	147	350	999	ND	7.5
Las Posas - West	02N21W17F05S	08/16/2012	0.7	320	97	ND	63	ND	1460	0.1	410	5	40	40	0.5	182	430	1140	ND	7.5
Las Posas - West	03N20W32K01S	08/22/2012	0.3	360	146	ND	24	ND	1420	0.1	770	6	45	320	ND	112	450	1140	ND	7.3
Las Posas - West	03N21W36Q01S	08/14/2012	0.2	270	80	ND	83	ND	1070	0.2	ND	4	41	ND	62.2	88	139	767	ND	7.5
Little Cuddy Valley	08N20W04N02S	11/01/2012	0.2	300	66	ND	15	10	569	0.2	ND	1	9	ND	1.3	40	14	446	20	7.0
Lockwood Valley	08N21W23Q10S	11/01/2012	13	410	3	20	8	ND	1110	2.2	260	ND	ND	ND	3.4	263	155	865	90	8.9
Lockwood Valley	08N21W29Q05S	11/01/2012	6.7	220	40	ND	12	ND	2620	1.4	ND	2	4	ND	1.3	647	1070	2000	20	7.9
Lockwood Valley	08N21W33R03S	09/27/2012	0.7	250	95	ND	22	ND	812	0.6	ND	1	23	ND	15.1	41	187	635	30	7.4
Mound	02N22W07P01S	08/15/2012	0.8	320	352	ND	120	ND	2880	0.1	310	9	106	160	49	221	1300	2480	ND	7.2
Mound	02N23W13F02S	09/05/2012	0.6	360	146	ND	65	ND	1550	0.2	460	5	40	290	ND	152	460	1230	ND	7.1
Mound	02N23W13K03S	09/05/2012	0.7	350	298	ND	120	ND	2690	0.1	ND	8	85	190	42.5	252	1120	2280	30	7.0
North Coast	04N25W25N06S	08/28/2012	0.3	570	147	ND	90	10	1580	0.3	ND	2	66	ND	8.3	121	370	1370	40	7.1
North Coast	04N25W35A07S	08/28/2012	0.2	350	97	ND	90	ND	1250	0.1	2000	2	48	380	2.1	102	165	856	500	7.1
North Coast	04N25W35G01S	08/28/2012	0.3	250	81	ND	25	40	872	0.4	ND	3	38	ND	1.9	52	219	670	280	7.7
Ojai Valley	04N22W04P05S	10/17/2012	ND	250	105	ND	22	ND	880	0.4	ND	2	28	ND	30.8	36	197	671	ND	7.2
Ojai Valley	04N22W06J09S	10/17/2012	0.2	270	117	ND	25	ND	902	0.4	ND	2	26	ND	22.1	31	198	692	ND	7.4
Ojai Valley	04N22W06K14S	10/17/2012	0.5	290	118	ND	136	ND	1300	0.5	ND	2	26	80	20.4	119	209	921	110	7.2
Ojai Valley	04N22W06M01S	10/17/2012	ND	330	116	ND	95	ND	1140	0.3	120	2	32	130	25.5	73	153	827	90	7.0
Ojai Valley	04N23W01K02S	10/17/2012	ND	470	184	ND	109	20	1420	0.5	ND	ND	43	ND	8.9	55	217	1090	20	7.0
Ojai Valley	05N22W32K02S	10/17/2012	0.3	250	81	ND	75	ND	1030	1.3	ND	1	6	40	3.5	128	190	736	30	7.5
Ojai Valley	05N22W33J01S	10/17/2012	0.1	90	105	ND	51	110	1040	0.3	290	2	38	50	ND	53	408	747	30	7.8
Oxnard Plain Forebay	02N22W27M02S	08/21/2012	0.6	240	125	ND	46	ND	1270	0.6	50	4	42	ND	8.3	87	400	953	90	7.4
Oxnard Plain Pressure	01N21W06L05S	08/16/2012	0.4	270	73	ND	41	ND	1130	0.1	380	5	27	60	ND	137	300	853	ND	7.8
Oxnard Plain Pressure	01N21W08R01S	08/27/2012	0.3	280	76	ND	56	ND	1100	0.1	260	6	28	40	ND	124	246	816	ND	7.6
Oxnard Plain Pressure	01N21W16M03S	08/15/2012	0.6	310	64	ND	134	ND	1430	0.2	ND	6	27	20	ND	206	250	997	ND	7.7

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^-	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Oxnard Plain Pressure	01N21W19J05S	08/15/2012	0.6	330	42	ND	40	ND	749	0.1	80	5	24	10	ND	80	52	573	ND	8.1
Oxnard Plain Pressure	01N21W19P05S	08/16/2012	0.6	230	92	ND	41	ND	1120	0.3	530	5	38	110	ND	86	350	842	ND	7.7
Oxnard Plain Pressure	01N21W20K03S	08/15/2012	0.6	270	74	ND	67	ND	1100	0.2	100	5	29	30	0.8	119	242	807	ND	7.7
Oxnard Plain Pressure	01N21W21H02S	08/27/2012	0.4	280	67	ND	100	ND	1280	0.1	80	5	36	20	ND	159	270	917	ND	7.6
Oxnard Plain Pressure	01N21W21H03S	08/15/2012	0.4	360	31	ND	43	ND	738	ND	1200	3	23	40	ND	91	ND	551	ND	7.2
Oxnard Plain Pressure	01N21W21K03S	08/30/2012	0.4	250	54	ND	42	ND	1050	ND	370	5	38	60	ND	124	279	792	ND	7.7
Oxnard Plain Pressure	01N21W22C01S	08/27/2012	0.4	310	61	ND	114	ND	1240	ND	550	4	41	50	ND	149	201	880	ND	7.7
Oxnard Plain Pressure	01N21W28D01S	08/27/2012	0.4	250	81	ND	85	ND	1230	0.1	50	6	34	20	ND	134	290	880	ND	7.5
Oxnard Plain Pressure	01N21W28G01S	08/15/2012	0.5	340	303	ND	600	ND	3160	ND	910	6	103	1600	ND	230	590	2170	ND	7.3
Oxnard Plain Pressure	01N21W28H04S	08/15/2012	0.4	310	89	ND	132	ND	1340	0.1	140	4	39	150	ND	143	230	947	40	7.6
Oxnard Plain Pressure	01N22W03F05S	09/05/2012	0.7	250	138	ND	49	ND	1380	0.3	ND	4	46	20	15.4	101	460	1060	ND	7.3
Oxnard Plain Pressure	01N22W03F08S	09/05/2012	0.9	290	208	ND	67	ND	1850	0.3	ND	5	70	60	39.5	118	680	1480	ND	7.2
Oxnard Plain Pressure	01N22W06B01S	08/15/2012	0.8	250	134	ND	49	ND	1370	0.4	ND	4	47	ND	19.3	96	440	1040	ND	7.4
Oxnard Plain Pressure	01N22W12M01S	10/30/2012	0.9	260	213	ND	65	ND	1970	0.7	ND	7	66	370	ND	156	800	1570	ND	7.2
Oxnard Plain Pressure	01N22W16D04S	08/30/2012	0.7	230	118	ND	37	ND	1120	0.5	760	4	34	110	ND	85	370	878	30	7.2
Oxnard Plain Pressure	01N22W19A01S	08/30/2012	0.7	230	103	ND	37	ND	1080	0.3	1340	4	33	170	ND	83	335	825	1620	7.5
Oxnard Plain Pressure	01N22W21B06S	08/30/2012	0.5	250	121	ND	42	ND	1170	0.1	620	5	30	190	ND	93	370	911	20	7.6
Oxnard Plain Pressure	01N22W25K01S	08/16/2012	0.8	220	756	ND	2130	ND	7230	ND	7410	18	235	2160	ND	474	500	4330	290	7.2
Oxnard Plain Pressure	01N22W25K02S	08/16/2012	0.7	260	114	ND	38	ND	1080	0.3	190	4	35	330	ND	88	305	844	ND	7.8
Oxnard Plain Pressure	01N22W26M03S	08/16/2012	0.5	240	114	ND	38	ND	1370	0.1	260	6	36	180	79.4	95	380	988	ND	7.5
Oxnard Plain Pressure	01N22W26P02S	08/16/2012	0.6	260	87	ND	40	10	1120	0.1	120	6	37	10	ND	97	310	837	20	7.6
Oxnard Plain Pressure	01N22W26Q01S	08/15/2012	0.7	250	127	ND	78	ND	1260	0.3	340	4	38	280	ND	88	340	925	ND	7.4
Oxnard Plain Pressure	02N21W19A01S	08/16/2012	0.8	290	178	ND	100	ND	1890	0.3	ND	6	67	ND	51.8	157	650	1500	20	7.2
Oxnard Plain Pressure	02N21W20Q05S	08/16/2012	0.6	260	98	ND	58	10	1290	0.1	550	6	35	80	ND	135	360	952	ND	7.6
Oxnard Plain Pressure	02N22W19J03S	08/21/2012	0.6	260	145	ND	56	ND	1510	0.5	50	5	44	170	1	123	510	1140	ND	7.5

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^-	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Oxnard Plain Pressure	02N22W24P02S	08/16/2012	0.7	250	125	ND	48	ND	1340	0.6	ND	4	44	ND	6.6	99	450	1030	ND	7.4
Oxnard Plain Pressure	02N22W24R02S	08/16/2012	0.7	250	131	ND	53	10	1390	0.5	930	5	48	390	ND	105	470	1060	1050	6.8
Oxnard Plain Pressure	02N22W25A02S	08/16/2012	0.7	240	149	ND	54	ND	1440	0.4	80	5	53	ND	19.4	100	510	1130	40	7.5
Oxnard Plain Pressure	02N22W25E01S	08/16/2012	1.1	300	207	ND	66	ND	2060	0.4	ND	6	88	ND	70.7	158	820	1720	ND	7.2
Oxnard Plain Pressure	02N22W25F01S	08/16/2012	0.7	260	145	ND	53	20	1530	0.5	510	5	56	20	26.7	114	530	1190	50	7.3
Oxnard Plain Pressure	02N22W31D02S	10/30/2012	0.7	250	143	ND	52	ND	1460	0.7	ND	5	45	110	17.3	109	490	1110	20	7.2
Oxnard Plain Pressure	02N22W36E02S	09/05/2012	0.7	250	140	ND	48	ND	1380	0.3	ND	4	45	ND	8.6	102	470	1070	ND	7.3
Oxnard Plain Pressure	02N22W36E03S	09/05/2012	0.7	260	143	ND	50	ND	1430	0.3	ND	5	48	40	ND	109	500	1120	ND	7.4
Oxnard Plain Pressure	02N22W36E05S	09/05/2012	0.9	280	192	ND	60	ND	1870	0.3	ND	5	70	30	40.1	138	730	1520	ND	7.3
Oxnard Plain Pressure	02N22W36F01S	08/30/2012	0.9	290	181	ND	58	ND	1720	0.3	200	6	64	30	1.5	135	680	1420	20	7.4
Oxnard Plain Pressure	02N22W36F02S	08/30/2012	0.9	280	193	ND	60	ND	1830	0.3	ND	6	67	50	4.8	152	730	1490	ND	7.4
Oxnard Plain Pressure	02N23W25G02S	08/15/2012	0.8	90	298	ND	180	ND	3100	ND	ND	8	103	40	59.1	307	1430	2480	ND	7.9
Oxnard Plain Pressure	02N23W25M01S	08/15/2012	0.7	280	193	ND	81	ND	1810	0.2	ND	5	54	480	17.1	155	630	1420	ND	7.4
Piru	04N18W30A03S	09/12/2012	0.6	300	136	ND	124	20	1660	0.3	90	6	51	ND	55.3	138	420	1230	100	7.5
Piru	04N18W30J04S	09/12/2012	0.4	200	67	ND	61	ND	966	0.4	ND	4	26	ND	7.8	90	227	683	20	7.7
Piru	04N19W23R03S	09/12/2012	0.5	470	173	ND	43	ND	2180	0.3	ND	6	103	110	1.5	189	830	1820	ND	6.8
Piru	04N19W25H01S	09/12/2012	0.6	280	148	ND	106	ND	1520	0.4	ND	5	49	ND	34.8	107	400	1130	30	7.4
Piru	04N19W25K04S	09/12/2012	0.6	270	124	ND	103	ND	1410	0.4	ND	5	44	ND	25.3	105	350	1030	ND	7.6
Piru	04N19W25M03S	09/12/2012	0.7	410	282	ND	58	170	2570	0.4	ND	7	121	670	12	205	1230	2330	90	7.0
Piru	04N19W26H01S	09/12/2012	0.7	330	150	ND	101	ND	1620	0.4	ND	5	61	ND	25	117	480	1270	ND	7.1
Piru	04N19W26J02S	08/20/2012	0.9	580	304	ND	66	ND	2580	0.3	ND	6	118	430	40.8	179	1140	2430	ND	7.0
Piru	04N19W26J03S	08/20/2012	0.5	260	113	ND	102	ND	1320	0.4	ND	5	43	ND	15.3	110	330	979	ND	7.4
Piru	04N19W26J05S	08/20/2012	1	430	290	ND	64	ND	2480	0.4	ND	6	114	610	22.9	162	1100	2190	20	7.1
Piru	04N19W26P01S	09/04/2012	0.7	310	165	ND	63	ND	1620	0.6	ND	5	66	40	17.2	107	550	1280	ND	7.2
Piru	04N19W34D03S	08/20/2012	0.6	330	147	ND	67	40	1490	0.4	ND	6	56	ND	27.3	100	470	1200	111	7.1
Piru	04N19W34D05S	08/20/2012	0.7	300	158	ND	68	ND	1580	0.3	ND	6	61	ND	29.5	105	520	1250	ND	7.1
Piru	04N19W34J04S	08/20/2012	0.4	310	141	ND	51	ND	1370	0.2	340	4	33	410	ND	116	410	1070	ND	7.3
Pleasant Valley	01N21W01B05S	08/21/2012	0.3	380	51	ND	195	ND	1340	ND	920	7	51	60	ND	140	44	868	ND	7.6

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^-	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
Pleasant Valley	01N21W03D01S	09/12/2012	0.4	240	137	ND	90	20	1450	0.1	ND	4	39	20	41.8	104	390	1050	ND	7.4
Pleasant Valley	01N21W03K01S	08/27/2012	0.7	310	138	ND	175	ND	1770	0.1	ND	5	41	50	26.2	194	370	1260	ND	7.4
Pleasant Valley	01N21W03R01S	08/27/2012	0.5	290	238	ND	250	ND	2370	ND	ND	5	73	30	21.1	191	690	1760	ND	7.2
Pleasant Valley	01N21W04K01S	08/27/2012	0.4	290	99	ND	120	10	1400	0.2	80	5	31	60	ND	166	320	1030	ND	7.5
Pleasant Valley	01N21W10G01S	08/27/2012	0.4	300	94	ND	157	ND	1500	ND	130	6	41	30	ND	168	290	1060	ND	7.4
Pleasant Valley	01N21W12D02S	08/24/2012	0.7	380	263	ND	400	ND	3070	ND	250	5	124	230	ND	258	870	2300	ND	7.0
Pleasant Valley	01N21W15D02S	08/27/2012	0.5	310	171	ND	230	ND	1950	ND	ND	5	55	200	ND	183	470	1420	ND	7.2
Pleasant Valley	01N21W15H01S	08/15/2012	1.7	240	554	ND	760	ND	5570	ND	2400	8	224	2000	ND	633	2350	4770	ND	7.2
Pleasant Valley	02N20W17L01S	08/14/2012	0.8	250	174	ND	176	ND	1890	0.2	90	6	53	270	24.5	196	560	1440	ND	7.2
Pleasant Valley	02N20W19F04S	08/27/2012	0.7	260	196	ND	163	ND	1900	ND	130	5	48	140	ND	165	600	1440	ND	7.4
Pleasant Valley	02N20W29B02S	08/24/2012	0.2	340	78	ND	128	20	1250	0.2	60	3	54	60	5.5	113	166	888	ND	7.6
Pleasant Valley	02N21W34C01S	08/27/2012	0.3	270	97	ND	74	ND	1140	0.2	270	5	28	50	ND	110	260	844	ND	7.5
Pleasant Valley	02N21W34G01S	08/27/2012	0.8	360	90	ND	193	ND	1770	0.2	100	7	32	30	ND	261	320	1260	ND	7.5
Santa Paula	03N21W09K04S	08/20/2012	0.5	230	112	ND	55	ND	1170	0.7	ND	4	44	ND	9.5	75	360	890	ND	7.2
Santa Paula	03N22W35Q01S	08/16/2012	1.1	300	303	ND	96	ND	2900	0.1	ND	7	92	710	30	308	1270	2410	120	7.1
Santa Paula	03N22W36K07S	08/16/2012	0.5	310	221	ND	69	ND	1660	0.2	210	4	54	150	ND	91	610	1360	ND	7.2
Sherwood	01N19W19H03S	08/28/2012	0.1	350	65	ND	39	ND	833	ND	70	2	40	20	ND	54	89	639	310	7.4
Sherwood	01N20W25C07S	08/28/2012	0.1	370	246	ND	360	20	2100	ND	80	2	75	10	0.8	83	240	1380	1590	7.0
Sherwood	01N20W25F04S	08/28/2012	0.1	280	28	ND	30	40	559	ND	3850	ND	8	60	ND	94	24	464	700	7.8
Simi Valley	02N18W08D04S	08/29/2012	1.2	370	228	ND	160	ND	2370	0.3	80	6	84	310	17.5	212	810	1890	ND	7.2
Simi Valley	02N18W08K07S	08/29/2012	1	240	280	ND	160	ND	2480	0.4	6130	5	85	ND	58.8	195	960	1980	ND	7.0
Simi Valley	02N18W09E01S	08/29/2012	0.9	270	209	ND	128	20	2060	0.5	ND	4	74	ND	26.6	169	750	1630	ND	7.2
Thousand Oaks	01N19W08G02S	08/28/2012	0.2	340	134	ND	129	ND	1790	ND	840	3	111	110	ND	107	500	1320	ND	7.2
Thousand Oaks	01N19W09N01S	08/28/2012	0.2	340	152	ND	173	ND	1980	ND	960	3	118	40	ND	123	520	1430	ND	7.2
Tierra Rejada Valley	02N19W10R02S	08/29/2012	0.2	270	54	ND	72	ND	955	0.3	ND	1	59	ND	9.2	61	177	704	ND	7.5
Tierra Rejada Valley	02N19W11J03S	08/24/2012	0.2	270	63	ND	63	ND	969	0.1	ND	1	57	ND	21.7	55	164	695	210	7.6
Tierra Rejada Valley	02N19W14F01S	08/29/2012	0.2	320	89	ND	120	ND	1240	0.2	ND	ND	78	ND	91.2	45	117	860	ND	7.2
Tierra Rejada Valley	02N19W14Q02S	08/29/2012	0.1	330	40	ND	65	ND	843	ND	ND	6	44	40	2.9	73	81	642	60	7.3
Tierra Rejada Valley	02N19W14R03S	08/29/2012	ND	320	29	ND	38	ND	684	ND	ND	4	38	20	7.7	62	40	539	90	7.6
Tierra Rejada Valley	02N19W15B01S	08/29/2012	0.2	300	103	ND	148	ND	1370	0.2	ND	1	73	ND	62.5	72	213	973	ND	7.3
Tierra Rejada Valley	02N19W15J02S	08/29/2012	0.3	380	91	ND	147	10	1510	0.1	ND	3	86	ND	62.1	108	240	1120	ND	7.7
Tierra Rejada Valley	02N19W15N03S	08/24/2012	ND	270	67	ND	83	ND	993	0.1	60	2	59	ND	3.1	47	162	693	ND	7.4

Table D-1 General Minerals (cont.)

GW Basin	SWN	Date	B	HCO_3^-	Ca	CO_3^-	Cl^-	Cu	E C	F^-	Fe	K	Mg	Mn	NO_3^-	Na	SO_4^{2-}	TDS	ZN	pH
U N D E F I N E D	02N20W18A01S	08/14/2012	0.2	180	81	ND	29	20	715	0.2	ND	3	19	30	5.2	45	161	523	ND	7.5
U N D E F I N E D	02N21W13A01S	08/22/2012	0.1	220	64	ND	12	ND	645	0.2	120	3	17	60	ND	41	124	481	100	7.6
Undefined	03N22W02H04S	08/28/2012	1.4	760	198	ND	180	ND	3060	0.1	90	9	121	100	7.9	386	900	2560	ND	7.1
Undefined	04N22W36C03S	08/28/2012	3.9	950	112	ND	1510	ND	6340	0.1	5100	14	61	40	ND	1390	420	4460	ND	7.4
Upper Ojai	04N22W08Q01S	08/21/2012	0.3	490	57	ND	23	ND	929	0.4	ND	2	15	20	ND	131	35	753	ND	7.9
Upper Ojai	04N22W10K02S	09/25/2012	0.3	430	118	ND	103	ND	1250	0.3	ND	ND	27	90	4.8	101	150	934	ND	7.0
Upper Ojai	04N22W11J01S	08/21/2012	0.2	270	56	ND	28	20	624	0.2	ND	1	18	ND	27.9	40	52	493	ND	7.0
Upper Ojai	04N22W11P02S	09/25/2012	ND	260	38	ND	15	ND	464	ND	2130	ND	11	250	ND	44	5	373	30	7.3
Upper Ojai	04N22W12F04S	09/25/2012	ND	210	83	ND	16	ND	727	0.1	ND	1	24	ND	29.3	26	163	552	ND	6.7
Upper Ojai	04N22W12M03S	08/21/2012	0.2	230	55	ND	29	10	618	0.1	ND	1	18	ND	28.9	39	48	449	ND	6.9
Ventura River - Lower	02N23W05K01S	08/28/2012	0.7	360	129	ND	118	ND	1570	0.3	200	7	44	160	2.7	157	350	1170	30	7.4
Ventura River - Lower	03N23W32Q01S	08/28/2012	0.6	330	125	ND	118	ND	1430	0.4	780	5	42	90	ND	129	310	1060	ND	7.4
Ventura River - Upper	04N23W04H01S	08/21/2012	0.5	240	111	ND	38	ND	984	0.3	ND	2	29	ND	13.5	45	234	713	ND	7.7
Ventura River - Upper	04N23W09G03S	08/21/2012	0.4	360	139	ND	71	30	1220	0.2	1400	2	40	ND	37.1	57	196	902	440	7.4
Ventura River - Upper	04N23W29F02S	08/21/2012	0.4	230	109	ND	29	ND	914	0.3	ND	2	26	ND	2.4	40	219	658	170	7.3

* Undefined – These wells are outside of known groundwater basin boundaries.

Metals and Radio Chemistry
Elements (µg/L)

Al – Aluminum
Sb – Antimony
As – Arsenic
Ba – Barium
Be – Beryllium
Cd – Cadmium
Cr – Chromium
Pb – Lead
Hg – Mercury
Ni – Nickel
Se – Selenium
Ag – Silver
Tl – Thallium
V – Vanadium

Laboratory Methods

Chemical Constituent	Method
Al, Sb, As, Ba, Be, Cd, Cr, Pb, Ni, Se, Ag, Tl, B	EPA 200.8
Hg	EPA 245.1
Gross Alpha	EPA 900.0
Uranium,	EPA 908.0

Table D-2 Metals

GW Basin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Arroyo Santa Rosa	02N19W19P02S	08/24/2012	ND	ND	3	17	ND	ND	15	0.6	ND	ND	3	ND	ND	59
Arroyo Santa Rosa	02N20W23G03S	09/04/2012	ND	ND	3	29	ND	ND	2	0.2	0.02	ND	3	ND	ND	78
Arroyo Santa Rosa	02N20W24Q03S	08/24/2012	ND	ND	3	5	ND	ND	14	ND	ND	ND	5	ND	ND	60
Arroyo Santa Rosa	02N20W25C02S	08/24/2012	ND	ND	3	20	ND	ND	13	0.3	ND	3	6	ND	ND	59
Arroyo Santa Rosa	02N20W25C06S	08/24/2012	ND	ND	6	19	ND	ND	2	0.5	ND	12	7	ND	ND	57
Arroyo Santa Rosa	02N20W25D01S	08/24/2012	ND	ND	4	18	ND	ND	2	5.4	ND	5	4	ND	ND	61
Arroyo Santa Rosa	02N20W26C02S	09/12/2012	ND	ND	4	33	ND	ND	6	ND	ND	64	10	ND	ND	47
Cuyama Valley	07N23W15P01S	09/27/2012	ND	ND	ND	10	ND	ND	ND	ND	ND	3	ND	ND	ND	ND
Cuyama Valley	08N24W17G02S	09/27/2012	ND	ND	ND	23	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cuyama Valley	09N23W30E05S	09/27/2012	ND	ND	ND	27	ND	ND	2	1.9	ND	ND	6	ND	ND	3
Cuyama Valley	09N24W25J01S	09/27/2012	ND	ND	ND	23	ND	ND	1	ND	ND	ND	6	ND	ND	ND
Fillmore	03N20W02R05S	11/06/2012	ND	ND	2	24	ND	1	3	0.2	ND	4	20	ND	ND	3
Fillmore	04N19W29R04S	09/04/2012	ND	ND	ND	15	ND	ND	ND	ND	ND	ND	3	ND	ND	ND
Fillmore	04N20W13P03S	09/14/2012	ND	ND	ND	24	ND	ND	ND	0.8	ND	ND	9	ND	ND	ND
Fillmore	04N20W32R03S	11/06/2012	ND	ND	ND	43	ND	ND	1	ND	ND	ND	6	ND	ND	ND
Gillibrand/Tapo	03N18W24C07S	08/29/2012	20	ND	2	74	ND	ND	ND	0.9	ND	ND	49	ND	ND	15
Las Posas - East	02N20W16B06S	10/30/2012	ND	ND	ND	16	ND	ND	3	ND	ND	6	4	ND	ND	ND
Las Posas - East	03N20W28J04S	08/22/2012	ND	ND	ND	42	ND	ND	7	0.3	ND	ND	13	ND	ND	6
Las Posas - South	02N19W07B02S	08/14/2012	ND	ND	ND	15	ND	ND	ND	ND	ND	12	2	ND	ND	7
Las Posas - West	02N20W06J01S	08/30/2012	ND	ND	ND	59	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Las Posas - West	02N21W11A03S	08/14/2012	ND	ND	ND	44	ND	ND	ND	1.3	ND	ND	ND	ND	ND	ND
Las Posas - West	02N21W15M04S	08/14/2012	ND	ND	ND	39	ND	ND	ND	0.3	ND	2	16	ND	ND	ND
Las Posas - West	03N20W32K01S	08/22/2012	ND	ND	ND	27	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Little Cuddy Valley	08N20W04N02S	11/01/2012	ND	ND	2	146	ND	ND	4	0.4	0.79	ND	6	ND	ND	2
Lockwood Valley	08N21W23Q10S	11/01/2012	ND	ND	81	21	ND	ND	5	0.4	ND	ND	20	ND	ND	66
Lockwood Valley	08N21W29Q05S	11/01/2012	ND	ND	8	11	ND	ND	3	ND	0.04	ND	13	ND	ND	15
Lockwood Valley	08N21W33R03S	09/27/2012	ND	ND	ND	26	ND	ND	2	0.6	ND	1	6	ND	ND	4
Mound	02N23W13K03S	09/05/2012	ND	ND	ND	23	ND	0	ND	0.3	0.04	12	23	ND	ND	ND
Ojai Valley	04N22W04P05S	10/17/2012	20	ND	ND	29	ND	ND	1	ND	ND	ND	2	ND	ND	ND
Ojai Valley	04N23W01K02S	10/17/2012	ND	ND	ND	69	ND	ND	1	2.1	ND	1	2	ND	ND	2
Ojai Valley	05N22W32K02S	10/17/2012	ND	ND	ND	44	ND	ND	2	ND	0.05	ND	11	ND	ND	ND
Oxnard Plain Pressure	01N21W21H02S	08/27/2012	ND	ND	ND	40	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oxnard Plain Pressure	01N21W28G01S	08/15/2012	ND	ND	5	85	ND	ND	ND	0.3	ND	1	7	ND	ND	ND
Oxnard Plain Pressure	01N22W03F05S	09/05/2012	ND	ND	ND	21	ND	ND	ND	0.2	ND	1	12	ND	ND	2
Oxnard Plain Pressure	01N22W25K02S	08/16/2012	10	ND	ND	39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table D-2 Metals (cont.)

GW Basin	SWN	Date	Al	Sb	As	Ba	Be	Cd	Cr	Pb	Hg	Ni	Se	Ag	Tl	V
Oxnard Plain Pressure	01N22W26Q01S	08/15/2012	20	ND	ND	83	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Oxnard Plain Pressure	02N21W19A01S	08/16/2012	ND	ND	ND	28	ND	0	ND	ND	ND	4	48	ND	ND	4
Oxnard Plain Pressure	02N22W36F02S	08/30/2012	ND	ND	ND	24	ND	0	ND	ND	ND	1	23	ND	ND	11
Piru	04N18W30A03S	09/12/2012	ND	ND	ND	32	ND	0	ND	0.8	ND	3	4	ND	ND	3
Piru	04N19W23R03S	09/12/2012	ND	ND	ND	18	ND	1	ND	ND	ND	7	ND	ND	ND	2
Piru	04N19W25H01S	09/12/2012	ND	ND	ND	21	ND	0	ND	0.3	ND	2	4	ND	ND	3
Piru	04N19W25M03S	09/12/2012	ND	ND	4	21	ND	1	ND	0.2	ND	12	233	ND	ND	3
Piru	04N19W26H01S	09/12/2012	ND	ND	ND	21	ND	ND	ND	ND	ND	1	3	ND	ND	2
Pleasant Valley	01N21W03R01S	08/27/2012	ND	ND	ND	37	ND	ND	ND	ND	ND	ND	13	ND	ND	5
Pleasant Valley	02N20W17L01S	08/14/2012	ND	ND	2	25	ND	ND	ND	ND	ND	8	15	ND	ND	ND
Pleasant Valley	02N20W29B02S	08/24/2012	ND	ND	5	50	ND	ND	2	ND	ND	ND	3	ND	ND	17
Pleasant Valley	02N21W34C01S	08/27/2012	ND	ND	ND	56	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Santa Paula	03N22W35Q01S	08/16/2012	10	ND	ND	24	ND	0	ND	ND	ND	2	68	ND	ND	2
Thousand Oaks	01N19W09N01S	08/28/2012	ND	ND	ND	22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tierra Rejada Valley	02N19W15J02S	08/29/2012	ND	ND	3	11	ND	ND	2	1.7	ND	ND	8	ND	ND	22
Tierra Rejada Valley	02N19W15N03S	08/24/2012	ND	ND	4	7	ND	ND	ND	ND	ND	1	ND	ND	ND	8
U N D E F I N E D	02N21W13A01S	08/22/2012	ND	ND	ND	40	ND	ND	ND	0.4	ND	ND	ND	ND	ND	ND
Upper Ojai	04N22W10K02S	09/25/2012	ND	ND	2	89	ND	1	ND	0.4	ND	2	9	ND	ND	7
Upper Ojai	04N22W11P02S	09/25/2012	20	ND	ND	245	ND	ND	ND	0.5	ND	ND	ND	ND	ND	ND
Upper Ojai	04N22W12F04S	09/25/2012	ND	ND	ND	41	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Table D-3 Radiochemistry

Groundwater Basin	SWN	Date	Alpha pCi/L	CE	Uranium pCi/L	CE
Piru	04N19W23R03S	09/12/2012	14	4.67		
Little Cuddy Valley	08N20W04N02S	11/01/2012	8.92	1.3	5.11	1.25
Lockwood Valley	08N21W23Q10S	11/01/2012	26	5.02	19.2	2.34
Lockwood Valley	08N21W29Q05S	11/01/2012	29.9	7.28	15.8	2.13
Lockwood Valley	08N21W33R03S	09/27/2012	11.3	2.91	6.81	1.65

* CE – Counting Error