16
HYDROLOGY AND WATER QUALITY

16.1 INTRODUCTION

This section addresses the potential impacts to hydrology and water quality from implementation of the proposed Santa Clarita Valley Sanitation District (SCVSD) Chloride Compliance Project (proposed project). This section describes the existing hydrologic and water quality conditions, including local surface water and groundwater resources; summarizes the relevant regulatory background; evaluates the potential impacts that may result from implementing the proposed project; and identifies mitigation to minimize potential effects. The majority of the components for all four proposed project alternatives would be located in proximity to portions of the Santa Clara River (SCR) within the Upper Santa Clara River (USCR) hydraulic area.

The analysis in this section is based in part on the modeling results prepared by AMEC using two Groundwater Surface Water Interaction Model (GSWIM) runs (AMEC-Geomatrix 2012 and 2013). The two modeling results (2012 GSWIM and 2013 GSWIM) are presented in Appendix 16-A along with a technical memorandum discussing the 2012 GSWIM run results prepared by Environmental Science Associates (ESA 2012). The analysis in this section is also based on the Reduced Discharge Technical Study (ESA 2010) prepared to evaluate the effects of reducing existing recycled water discharges from the Valencia Water Reclamation Plant (VWRP) and Saugus Water Reclamation Plant (SWRP) on hydrological and biological resources within the SCR extending from just upstream of the SWRP downstream to the confluence of Piru Creek. The Reduced Discharge Technical Study is included as Appendix 6-A**.**

16.2 ENVIRONMENTAL SETTING

16.2.1 Regional Watershed

The majority of the project components for the four proposed project alternatives would be located in proximity to portions of the SCR within the USCR hydraulic area (RWQCB 1994), which spans from the eastern portion of the SCR to Blue Cut just west of the Los Angeles-Ventura County line (see Figure 2-6). Some of the project components for Alternative 4 would be located in the Piru Subbasin, located west and downstream of the Los Angeles-Ventura County line and in the Lower SCR hydraulic area.

The SCR is one of the largest rivers in Southern California with a total length of approximately 84 miles (United Water Conservation District [United Water] 2012) and a watershed covering approximately 1,600 square miles (CH2M HILL and HydroGeoLogistics [CH2M-HGL] 2006). The SCR is the last major river in the region that exists in a relatively natural state with a maximum watershed relief (elevation) of approximately 8,800 feet above mean sea level (amsl) at Mount Piños to sea level near the City of Ventura (ESA 2010).

In the proposed project area, the watershed drains into the SCR and then flows east to west, sequentially from the SCR Valley East (East) Subbasin to and through the Blue Cut (a narrow and shallow geological structural gap just west of the Los Angeles-Ventura County line) into the Piru Subbasin and to the Fillmore Narrows (a narrower far-west portion of the Piru Subbasin) which then drains into the Fillmore Subbasin. Flow then continues sequentially westward through the Santa Paula, Oxnard Forebay, and Oxnard Plain Subbasins, eventually draining into the Pacific Ocean. The geology, structure, and flow patterns of surface water and groundwater in the Santa Clarita and Piru Valleys (East and Piru Subbasins, respectively) are illustrated on schematic hydrogeologic block diagrams prepared for the GSWIM (see Figures 2-7 and 2-8, respectively). The geology of the proposed project area is described in Section 14. The hydrology and water quality of the subbasins are summarized in this section with focus on the water-bearing geologic materials and hydrologic units.

16.2.2 Climate

The weather in Southern California is characterized by coastal, inland, mountain, and desert climate zones that have distinct characteristics and are located in close proximity. Characteristics of these climate zones depend on distance from the Pacific Ocean, latitude, and terrain (i.e., land surface elevation). The GSWIM study area has a semi-arid Mediterranean-type climate, characterized by long, dry summers with short, and sometimes wet, winters. Mean monthly temperatures in the Santa Clarita and Piru Valleys have historically ranged from approximately 35 degrees Fahrenheit (°F) to 95°F. Record temperatures in the area have been measured at 15°F in Santa Clarita in 1968 and 116°F in Piru in 1985.

Precipitation data have been recorded since 1927 at the Piru-Newhall Ranch rain gauge, located near the Blue Cut area just west of the Los Angeles-Ventura County line. The mean annual precipitation at this gauge was 17.55 inches from calendar year (CY) 1928 to 2006 (similar for water years). Annual precipitation is highly variable. During this period, the highest and lowest CY precipitation was 41.72 inches in 1983, and 3.16 inches in 1947. Precipitation is not only variable on an annual basis, but is also highly seasonal. In an average year, over 80 percent of the annual precipitation at the Piru-Newhall Ranch rain gauge falls between November and March. Most of the precipitation falls during winter storms that last a few days and are separated by relatively long periods of clear weather.

16.2.3 Surface Water

The headwaters and principal tributaries of the SCR are mountain streams originating from the National Forest lands to the north with minor inflow from southern tributaries (ESA 2010). All surface water flows into the SCR, which flows east to west from the East Subbasin to and through Blue Cut into the Piru Subbasin, and then into the eastern portion of the Fillmore Subbasin and subbasins further downstream. In addition, releases from reservoirs and several point sources contribute to surface water flow. Several larger surface water diversions also contribute to the surface hydrology. The information in the following subsections is summarized from CH2M-HGL (2006), unless otherwise cited.

16.2.3.1 Santa Clara River

Stream flow in the SCR consists of storm flow and base flow. Base flow consists of groundwater, effluent from the water reclamation plants (WRPs), reservoir releases, other point sources, bank seepage, and nonpoint discharge from agricultural and urban runoff (USGS 2003). The Basin Plan identifies the following surface water reaches from west to east for the SCR (RWQCB 1994):

- Reach 1 – Santa Clara Estuary to Highway 101
- Reach 2 – Highway 101 to Freeman Diversion Dam
- Reach 3 – Freeman Diversion Dam to A Street, Fillmore
- Reach 4A – A Street, Fillmore to Piru Creek
- Reach 4B – Piru Creek to Blue Cut Gauging Station
- Reach 5 – Blue Cut Gauging Station to West Pier Highway 99 Bridge
- Reach 6 – West Pier Highway 99 Bridge to Bouquet Canyon Road
- Reach 7 – Bouquet Canyon Road to Lang Gauging Station
- Reach 8 – Above Lang Gauging Station

The proposed project components and the GSWIM domain are located within Reaches 3 through 7 and are discussed below from upstream to downstream. The extent of the reaches in the East and Piru Subbasins, and other surface water features are shown on Figure 16-1. The location of stream flow gauges are shown on Figure 16-2.

Reach 7

In the East Subbasin within the eastern portion of the proposed project area, Reach 7 extends from the Lang stream gauging station (11107745) at the far eastern extent of the GSWIM domain to just northeast of the SWRP at the Bouquet Canyon Bridge. This portion of the SCR is a losing stream where surface water infiltrates downward to groundwater in the underlying aquifer, as shown by the presence of a dry gap section east of the SWRP and sometimes seasonally extending as far upstream as the Lang Stream Gauge. Stream flow at the Lang Gauge is ephemeral (an ephemeral waterbody only exists for a short period following precipitation or snowmelt).

Reach 6

Reach 6 begins just northeast of the SWRP where it flows westerly to just east of the VWRP at West Pier Highway 99 Bridge near Stream Gauge SW1 (SCR-RD) and is entirely within the East Subbasin. The Reach 7 dry gap ends before Reach 6 near the SWRP because there are a number of tributaries that feed the SCR at this location and the SWRP continuously discharges recycled tertiary-treated water into the SCR. Surface water flows year-round beginning at the SWRP in most of Reach 6. Beginning about 1 mile downstream of the SWRP is the short (less than 1 mile long) McBean Dry Gap, which occurs for most of the year (ESA 2010). Stream flow from downstream of the McBean Dry Gap to the VWRP is nearly perennial (a perennial waterbody exists all year round), with groundwater upwelling occurring from the confluence with the San Francisquito Creek to the VWRP (ESA 2010). From January 1975 through September 2004, this portion of the stream channel was dry only 2 percent of the time.

Reach 5

Reach 5 begins at West Pier Highway 99 Bridge just east of the VWRP and extends to Blue Cut at Stream Gauge 11108500 (SW3), approximately 1 mile west of the Los Angeles-Ventura County line. Reach 5 has perennial surface water flow (AMEC-Geomatrix 2009). Groundwater upwelling contributes to SCR base flow in this area because of two geologic conditions. Reach 5 overlies the downgradient (western) side of the underlying Saugus Formation syncline within the East Subbasin. Groundwater flows from east to west and at the western end of the syncline, groundwater is forced under artesian pressure to rise (upwell) to the surface. In addition, moving downstream and closer to Blue Cut, bedrock becomes less deep, leading to thinning alluvium that also forces groundwater to rise (ESA 2010). At Blue Cut, surface and groundwater flow becomes constricted because of the previously-discussed narrow and shallow geological structural gap. Flow on the upstream side of Blue Cut backs up, as observed by the year-round surface water flow and the upward flow of groundwater. This condition makes this reach of the SCR a gaining stream.

Other notable contributors to the base flow include discharges from the VWRP and SWRP, bank seepage (bank seepage consists of water stored in stream banks during high-water flows that seeps back into the stream during low-water flow conditions), precipitation, upstream runoff, agricultural and urban runoff (including irrigation runoff), and perennial flows from Castaic Creek. Periodic releases of water from Castaic Lake also contribute to the SCR base flow downstream of where Castaic Creek joins the SCR. The relative contribution to SCR base flow from these sources varies with the time of year and location along the river.

Stream flow at the Blue Cut Gauge (SW3), located between the East and Piru Subbasins, is perennial. The Blue Cut gauge was removed from service in October 1996.

Reach 4B

Reach 4B extends from Blue Cut to the confluence with Piru Creek at about Stream Gauge 04N18W30SW1 (SW5) and is entirely within the Piru Subbasin. Stream flow above the Las Brisas Bridge (SW4) is perennial. A seasonal dry gap, herein referred to as the Piru Dry Gap, begins at just past Stream Gauge 111109000 (SW4) at the Las Brisas Bridge and extends west to Stream Gauge 04N19W33SW1 (SW6), where perennial surface water reappears. Once flow passes by Blue Cut, the depth of permeable sediments quickly increases and the canyon widens. This results in a much larger volume of permeable sediments just downstream of the Blue Cut constriction. Surface water infiltrates into the subsurface in this losing-stream portion of the SCR, thus resulting in the Piru Dry Gap. The Las Brisas Bridge gauge has been the downstream replacement for the Blue Cut gauge since October 1996.

Reach 4A

Reach 4A begins in the Piru Subbasin at the downstream end of Reach 4B and extends from the confluence of Piru Creek at about Stream Gauge SW5 to A Street in the City of Fillmore within the eastern portion of the Fillmore Subbasin past Stream Gauge SW6. The Piru Dry Gap extends downstream to about Stream Gauge SW6 with perennial surface water flow typically reappearing at this point. Here, Piru Canyon narrows at what is referred to as the Piru Narrows where the Fillmore Fish Hatchery is located. This narrowing results in the upwelling of groundwater and the SCR is typically a gaining stream from this location into the Fillmore Subbasin (ESA 2010). As the SCR enters the Fillmore Subbasin, which is much wider and deeper than the upstream subbasins and has numerous additional sources of surface water flow, the volume of water is

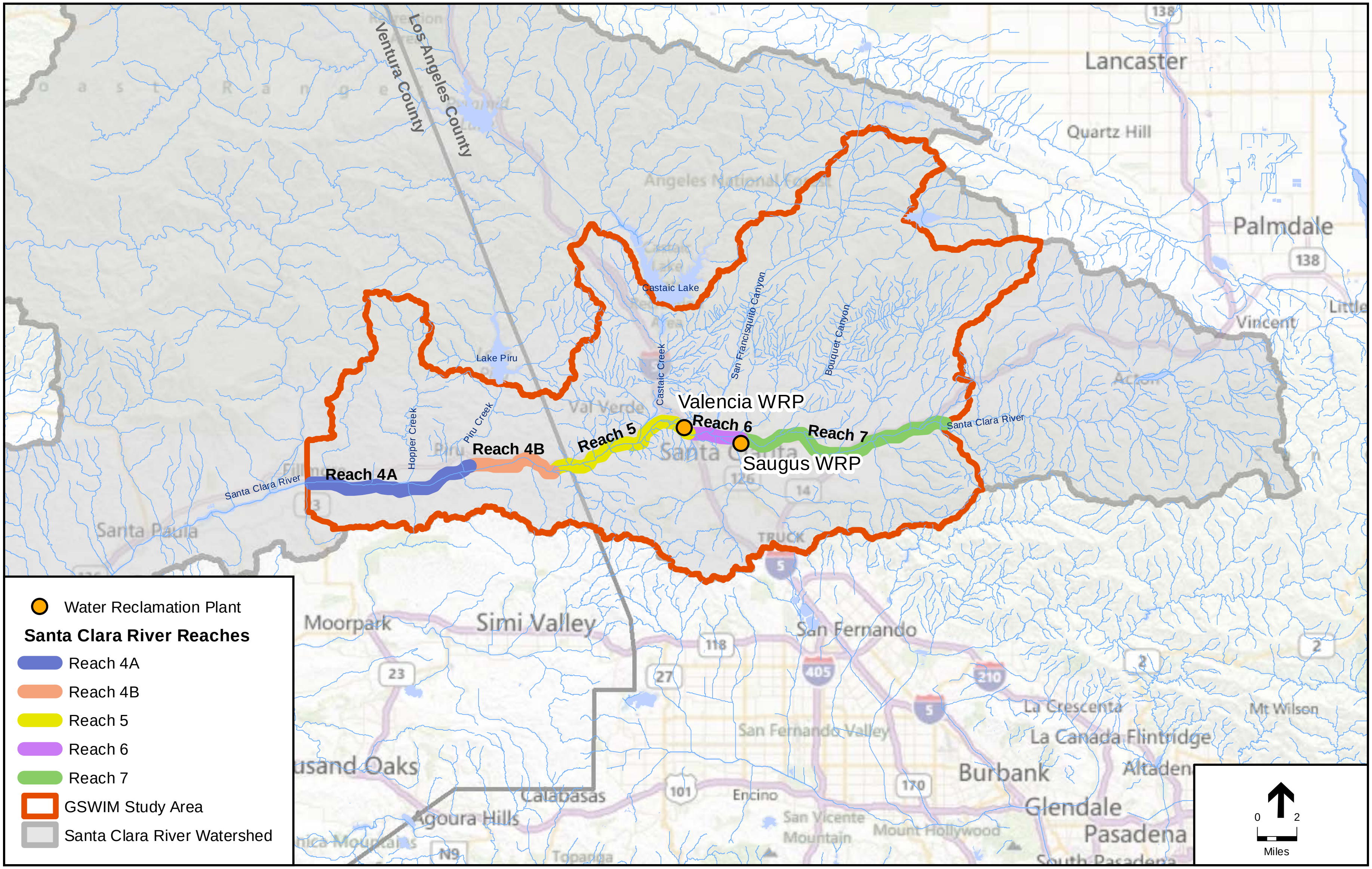

Figure 16-1

GSWIM Study Area and Surrounding Vicinity

Figure 16-2
Surface Water and Groundwater Sampling Locations

sufficient to maintain year-round surface water flow. The downstream end of Reach 4A is also the westernmost extent of the GSWIM domain.

Reach 3

Reach 3 begins at A Street in the City of Fillmore within the eastern portion of the Fillmore Subbasin and extends to the Freeman Diversion. In CY 2011, 92,600 acre-feet (af) of surface water were diverted from the SCR at the Freeman Diversion (United Water 2012).

16.2.3.2 Tributaries

Tributary stream flow into the SCR is ephemeral with most tributaries dry for much to most of the time. The majority of the main tributaries to the SCR are shown on Figure 16-1. Hopper Creek is located in the Piru Subbasin downstream of Piru Creek, and although ephemeral, has recorded stream flows of up to 4,290 cubic feet per second (cfs). Pole Creek, located in the Fillmore Subbasin just east of the City of Fillmore is nearly perennial with daily mean stream flows of up to 1,770 cfs. All other tributaries have smaller flows.

16.2.3.3 Industrial Point-Source Discharges

Point sources are defined under the National Pollutant Discharge Elimination System (NPDES) permit as discharges directly into a surface water. The primary permitted discharges into the USCR include the VWRP; SWRP; Six Flags Magic Mountain, Inc.; Keysor Century Corporation; City of Santa Clarita; Texaco Trading and Transportation, Inc.; and the Val Verde County Park Swimming Pool.

As the population of the Santa Clarita Valley (SCV) has increased, so have the discharges from the two treatment plants serving the community. In 1975, combined discharges equaled 4.9 million gallons per day (mgd) (5,500 acre-feet per year [afy]). By 1990, this had increased to 12.5 mgd (14,000 afy). The average combined treated water discharge of the VWRP and SWRP in 2011 was 19.5 mgd (22,000 afy). As previously discussed, the WRPs are located upstream of certain dry gaps. Consequently, all surface water flow, including the WRP's discharges, becomes base flow or groundwater at some point.

The WRPs are substantially larger than the other dischargers, whose 1975 to 2005 average annual range of discharge volumes are:

- Six Flags Magic Mountain, Inc. – 86 to 111 af
- Keysor Century Corporation – 106 to 107 af
- City of Santa Clarita – 27 to 29 af
- Texaco Trading and Transportation, Inc. – 18 to 90 af
- Val Verde County Park Swimming Pool – 0 to 0.56 af

16.2.3.4 Reservoir Releases

Castaic Lake, Lake Piru, and Bouquet Reservoir release surface water to tributaries that flow to the SCR.

- **Castaic Lake** – Castaic Lake stores flood flows and State Water Project (SWP) water delivered via the West California Aqueduct for subsequent potable uses and for groundwater percolation. Releases from the Castaic Lagoon located below the reservoir are intermittent, with daily mean releases of up to 675 cfs (CH2M-HGL 2006). From January 1987 through February 2005, this reservoir released water approximately 26 percent of the time. In 2011, approximately 11,000 af were released with most of the water infiltrating into the Piru Subbasin and some reaching the Fillmore Subbasin (United Water 2012).

- **Lake Piru** – Lake Piru stores high flows in Piru Creek during the winter and spring for subsequent release in the fall, depending on hydrologic conditions (United Water 2012). In addition, Lake Piru stores SWP water released from Pyramid Lake. Releases from Lake Piru into Piru Creek drain to the SCR in the Piru Dry Gap and replenish groundwater in the Piru Subbasin, as well as downstream subbasins. Releases are nearly continuous, with daily mean releases of up to 650 cfs. From 1975 through 2005, this reservoir released water approximately 98 percent of the time. Combined daily scheduled releases and unscheduled spills have been as high as 8,885 cfs since 1975. Between 1999 and 2011, releases from Lake Piru ranged from 9,100 to 47,400 afy. In 2011, United Water released 31,700 af (United Water 2012). Of this amount, about half infiltrated directly into the Piru and Fillmore Subbasins, and the remaining half either percolated into the Santa Paula Subbasin or was diverted at the Freeman Diversion.

- **Pyramid Lake** – Pyramid Lake, located upstream of Lake Piru, releases up to 3,150 afy to Lake Piru via Piru Creek depending on the availability of SWP water (United Water 2012). Between 1991 and 2011, releases from Pyramid Lake to Lake Piru ranged from 988 to 4,836 afy. All of this water is subsequently released from Lake Piru to Piru Creek and flows into the downstream subbasins.

- **Bouquet Reservoir** – Bouquet Reservoir is part of the Los Angeles Aqueduct system and provides municipal water supply (CH2M-HGL 2006). An agreement with United Water provides for the release of between 2,100 and 2,194 afy to recharge downstream aquifers (United Water 2012). The agreement requires the continual release of 5 cfs between April 1 and September 30, and 1 cfs between October 1 and March 31.

16.2.3.5 Diversions

The following major diversions are located within the proposed project area between Blue Cut and Piru Creek. The GSWIM includes data from these diversions. The general descriptions of diversions are from CH2M-HGL (2006) unless otherwise cited.

- The Camulos Ranch diversion is located on the SCR in Ventura County near the border with Los Angeles County just downstream of Stream Gauge SW3. Camulos Ranch diverted 0 to 3,000 afy between 1975 and 2005.

- The Isola diversion is located on Newhall Land and Farming (NLF) property on the SCR downstream of the Camulos diversion and before Stream Gauge SW4 and at the downstream end of Blue Cut. The Isola diversion ranged from 0 to 710 afy between 1975 and 2005.

- The Piru Mutual diversion is located on Piru Creek near the southern end of Piru Canyon. This diversion ranged from 920 to 2,000 afy between 1975 and 2005.

- The Piru Spreading Grounds diversion is located on Piru Creek before it joins the SCR at the southern end of Piru Canyon (United Water 2012). The Piru Spreading Grounds diversion ranged from 0 to 19,000 afy between 1975 and 2005. The diversion structure does not comply with the National Marine Fisheries Service's (NMFS') standards and has not been operated since September 2008.

16.2.4 Groundwater

16.2.4.1 East Subbasin

Extensive investigations of the East Subbasin have been conducted since the mid-1980s. The following paragraphs contain a summary of the East Subbasin descriptions from Richard C. Slade and Associates (RCS 2002) and CH2M-HGL (2006).

The East Subbasin consists of an alluvial trough bounded by granite and granodiorite of the San Gabriel Mountains to the east and southeast, the Santa Susana Mountains to the south, the Topatopa and Piru Mountains to the north and northwest, and the Sierra Pelona Mountains to the northeast. Lithologic units, from the stratigraphic top to the stratigraphic bottom, include alluvium, terrace deposits, and the Saugus Formation, which comprises the deepest freshwater-bearing formations in the SCV. The Saugus Formation is underlain by various non-freshwater-bearing formations. A schematic geologic block diagram for the East Subbasin is shown on Figure 2-7.

Groundwater in alluvial deposits of the East Subbasin exists under unconfined conditions and flows generally coincident with the flow of the overlying streams. Water levels in the western portion of the subbasin have historically been stable and are not strongly responsive to rainfall or recharge fluctuations. This is due in large part to the upward flow of groundwater from the underlying Saugus Formation into the alluvium. Water levels in the eastern portion of the subbasin show a stronger correlation to fluctuations in rainfall. The area east of the SWRP has a dry gap just upstream of the SWRP as shown on Figure 2-7. The SCR in the eastern portion of the East Subbasin is a losing stream with surface water infiltrating the alluvium.

The Saugus Formation is present throughout the main portion of the SCV and extends to the surrounding foothills. The Upper Saugus Formation (younger deposits) is the primary source of groundwater. The deeper and older portion of the Saugus Formation, the Sunshine Ranch Member, consists of low-permeability siltstone and sandstone. Because of the low yield of this formation and the presence of brackish water in its deeper portions, it is not considered viable for municipal water supply purposes.

Water levels in Saugus Formation wells have typically fluctuated over time, with the magnitude of these historic fluctuations varying with each well. These annual fluctuations have generally ranged from a minimum of 50 feet to a maximum of 175 feet. These fluctuations are considered to be small because the wells in which these fluctuations have occurred range in total depth from 750 feet to nearly 2,000 feet.

Underlying the freshwater-bearing sediments in the SCV are a series of consolidated, older, cemented sedimentary and crystalline rocks of Tertiary age or older. These formations contain alternating layers of permeable sand and impermeable shale.

16.2.4.2 Piru Subbasin

Extensive investigation of the hydrogeology in Ventura County has been performed by a variety of investigators. The following paragraphs contain a summary of the descriptions from CH2M-HGL (CH2M-HGL 2006), unless otherwise cited.

The Piru Subbasin consists of an alluvial trough bounded by the Topatopa Mountains and the San Cayetano Fault to the north and the Oak Ridge and Santa Susanna Mountains and the Oak Ridge Fault to the south. The subbasin narrows at both the western end at the Fillmore Fish Hatchery (Piru Narrows) and eastern end at Blue Cut. Lithologic units, from stratigraphic top to the stratigraphic bottom, include recent and older alluvium, terrace deposits, and the San Pedro Formation. These units are underlain by non-water-bearing formations. A schematic geologic block diagram for the Piru Subbasin is shown on Figure 2-8.

The groundwater storage capacity of the Piru Subbasin is estimated at about 1,979,000 af and the subbasin was estimated to be 90 percent full in 1990 (Department of Water Resources [DWR] 2004). Groundwater generally flows from east to west within both units, coincident with stream flow in the SCR. The San Pedro Formation does not extend to the Blue Cut gap at the eastern end of the Piru Subbasin and does not connect with the Saugus Formation in the East Subbasin; only the alluvial deposits are continuous between the subbasins. There may be small localized areas of flow with northerly or southerly components within the dipping beds of the San Pedro Formation; however, groundwater generally flows along the east-west axis of the basin.

United Water's evaluation of groundwater elevations in the Piru Subbasin over a period of approximately 50 years indicates that in wet cycles, groundwater levels tend to return to their historic highs, indicating that the subbasin is full (United Water 2009). In general, the hydraulic gradient is relatively steep in the eastern portion of the subbasin, where the basin is narrow and alluvial deposits are thin. These trends are amplified during dry years (e.g., the hydraulic gradient in the eastern portion of the subbasin is steeper than during normal years). Regardless of climate year, groundwater leaves the Piru Subbasin near the Fillmore Fish Hatchery through both the alluvial deposits and the San Pedro Formation (Mann 1959). The groundwater basin narrows in this area (Piru Narrows), creating a region of rising groundwater flowing into the Fillmore Subbasin in all but the driest years.

Underlying the freshwater-bearing sediments in the Piru Subbasin is a series of consolidated, older, cemented, and sedimentary rocks of late Cretaceous and Tertiary age. These formations are considered non-freshwater bearing and contain alternating layers of permeable sand and impermeable shale.

16.2.4.3 Fillmore Subbasin

Extensive investigation of the hydrogeology in Ventura County has been performed by a variety of investigators. The following paragraphs contain a summary of the descriptions from United Water (1996 and 2009) and CH2M-HGL (2006), unless otherwise cited.

The Fillmore Subbasin consists of an east-west oriented synclinal trough. Groundwater generally flows from east to west, coincident with stream flow in the overlying main stream channels. United Water's evaluation of groundwater elevations in the Fillmore Subbasin over a period of approximately 50 years indicates that, in wet cycles, groundwater levels tend to return to their historic highs, indicating that the subbasin is full. Water levels in the Fillmore Subbasin show much less fluctuations than those in the Piru Subbasin, both seasonally and during dry cycles.

The estimated groundwater storage capacity of the Fillmore Subbasin is about 7,330,000 af, and the subbasin was estimated to be 90 percent full in 1999 (DWR 2006).

Underlying the freshwater-bearing sediments in the Fillmore Subbasin is a series of consolidated, older, cemented, and sedimentary rocks of late Cretaceous and Tertiary age. These formations are considered non-freshwater bearing and contain alternating layers of permeable sand and impermeable shale.

16.2.5 Water Quality

16.2.5.1 Imported Water

Imported water from the SWP (Luhdorff and Scalmanini [L&S] 2012) is routed to Lake Piru and Castaic Lake and stored along with local runoff collected from upstream tributaries in the SCR Watershed (CH2M-HGL 2006). SWP water has total dissolved solids (TDS) concentrations that range from 250 to 360 milligrams per liter (mg/L) and hardness of 105 to 135 mg/L (L&S 2012). As discussed in Section 4.2.1, chloride concentrations in SWP water have historically ranged from below 40 mg/L to over 100 mg/L, depending on hydrologic conditions. With the recent changes to the SWP operations, peak chloride concentrations are not expected to exceed 85 mg/L in the future (Kennedy Jenks 2008).

16.2.5.2 Santa Clara River

AMEC conducted water quality trend analyses for the SCR at individual sample locations from 1994 to 2005 (AMEC 2006). This trend analysis indicated that TDS concentrations remain relatively constant between the Upper Santa Clara (East), Piru, Sespe (representing the Fillmore Subbasin), and Santa Paula[1] Watersheds.

Chloride concentrations showed a slight decreasing trend in the Upper Santa Clara Watershed and increasing trends in the Piru, Sespe, and Santa Paula Watersheds, with the chloride concentrations in the Piru Watershed consistently above the water quality objective of 100 mg/L (AMEC 2006). TDS and chloride concentrations in the SCR at two locations are summarized in Table 16-1.

Table 16-1. Summary of Chloride and TDS Concentrations

2011 Range of Concentrations in mg/L	Blue Cut	Downstream of Fillmore Fish Hatchery
Chloride	79 to 132	50 to 69
TDS	460 to 1,000	544 to 890

Source: AMEC 2006.

Table 4-2 in Section 4 summarizes the SWRP and VWRP effluent quality achieved in 2011 and the required NPDES discharge limits. All constituents were within the required limits.

[1] The Santa Paula Watershed is the next watershed downstream of the Sespe (Fillmore) Watershed.

16.2.5.3 Groundwater

East Subbasin

Groundwater in the alluvial aquifer gradually changes from a calcium bicarbonate character in the east to a calcium sulfate character in the western part of the subbasin (RCS 2002). TDS averages about 550 to 600 mg/L in the eastern and central portions of the subbasin. TDS concentrations are highest in the alluvial groundwater west of Interstate 5 (I-5), averaging about 1,000 mg/L.

Groundwater in the Saugus Formation aquifer varies from a calcium bicarbonate and sulfate water along the south fork of the SCR in the southeast, to a calcium sulfate water in the central and western part of the valley, to a calcium bicarbonate water further west within the central fault block (RCS 2002). TDS content in the Saugus Formation aquifer ranges from about 500 to 900 mg/L.

Based on available data over the last 50 years, groundwater quality in the Saugus Formation has exhibited a slight overall increase in dissolved mineral content. Since 2000, several wells within the Saugus Formation have exhibited an additional increase in dissolved mineral content, similar to short-term changes in the alluvium, possibly as a result of recharge to the Saugus Formation from the alluvium. Since 2005, however, these levels have been steadily dropping or remaining within the recent 10-year range.

Piru Subbasin

Because the San Pedro Formation is unconfined and in direct hydraulic communication with the overlying alluvial deposits, the groundwater quality data is generally not differentiated between the two units. Groundwater in this subbasin is generally calcium sulfate in character and TDS concentrations range from 800 to 2,400 mg/L, with an average of approximately 1,300 mg/L (DWR 2004). Data for three public supply wells ranged from 930 to 990 mg/L and averaged 957 mg/L for TDS.

From 1975 to 1988, chloride concentrations ranged from 35 to 177 mg/L with an average of 60 mg/L (United Water 1996). United Water reports that chloride concentrations in groundwater in the western portion of the Piru Subbasin are generally less than 70 mg/L (United Water 2012).

Fillmore Subbasin

Because the San Pedro Formation is unconfined and in direct hydraulic communication with the overlying alluvial deposits, the groundwater quality data is generally not differentiated between the two units. Water in this subbasin is calcium sulfate in character, although some groundwater in the Sespe Uplands area north of the SCR is calcium bicarbonate in character (United Water 1996). TDS concentration ranges from 800 to 2,400 mg/L with an average of 1,100 mg/L (United Water 1996). Data from nine public supply wells show a TDS content range of 660 to 1,590 mg/L, with an average of 967 mg/L (DWR 2006).

From 1975 to 1988 chloride concentrations within the overall Fillmore Subbasin ranged from 8 to 202 mg/L with an average of 46 mg/L (United Water 1996). United Water reports that chloride concentrations above 70 mg/L in the Fillmore Subbasin are uncommon (United Water 2012).

16.3 REGULATORY BACKGROUND

16.3.1 Clean Water Act

The federal Water Pollution Control Act (33 USC. 1251 et. sec.), enacted in 1948 and amended in 1972, 1977, and 1987, established programs to control point and nonpoint discharges into waters of the U.S. and put in place the state revolving fund (SRF) loan program. As of the 1970s amendments, this regulation has been known as the Clean Water Act (CWA). Additional information on the CWA can be found in subsection 3.2.2.1.

16.3.2 Clean Water Act §402

CWA §402 regulates discharges to surface waters of the U.S. through the NPDES program. In California, the United States Environmental Protection Agency (EPA) authorizes the State Water Resources Control Board (SWRCB) to oversee the NPDES program through the nine California Regional Water Quality Control Boards (RWQCBs). Stormwater discharges are also regulated under CWA §402. Construction activities disturbing one acre or more of land are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit).

16.3.3 Clean Water Act §303(d)

CWA §303(d) requires that each state identify water bodies or segments of water bodies that are “impaired” (i.e., do not meet one or more of the water quality standards established by the state). These waters are identified in the §303(d) list as waters that are polluted and need further attention to support their beneficial uses. Once the water body or segment is listed, the state is required to establish a Total Maximum Daily Load (TMDL) for the pollutant. A TMDL is the maximum amount of a pollutant that a water body can receive and still meet the water quality standards. Typically, the TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. On November 12, 2011, the EPA gave final approval to the 2008-2010 list of impaired water bodies.

Table 16-2 summarizes the impaired water bodies from the Final 2010 Integrated Report (CWA §303[d]) list near the proposed project sites. Of the reaches located in the proposed project vicinity, Reaches 5 and 6 of the SCR are listed as impaired water bodies.

Table 16-2. Impaired Water Bodies in the Project Area

Water Body/Reach Name	Pollutant/Stressor	Potential Source
SCR, Reach 5	Chloride	Nonpoint + Point
	Coliform Bacteria	Nonpoint + Point
	Iron	Unknown
SCR, Reach 6	Chloride	Nonpoint + Point
	Chloryprifos	Nonpoint + Point
	Coliform Bacteria	Nonpoint + Point
	Copper	Nonpoint + Point
	Diazinon	Unknown
	Iron	Unknown
	Toxicity	Unknown

Source: RWQCB 2010.

16.3.4 Federal Emergency Management Agency

Under Executive Order 11988, the Federal Emergency Management Agency (FEMA) is responsible for the management and mapping of areas subject to flooding during a 100-year flood event (i.e., 1 percent chance of occurring in a given year). FEMA requires that local governments covered by federal flood insurance pass and enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year flood plain, as depicted on FEMA maps.

16.3.5 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969 (PCA) (Division 7 of the California Water Code) provides the basis for water quality regulation within California. The PCA defines water quality objectives as the limits or levels of water constituents that are established for reasonable protection of beneficial uses. The SWRCB administers water rights, water pollution control, and water quality functions throughout the State, while the RWQCBs conduct planning, permitting, and enforcement activities. The PCA requires each RWQCB to establish a regional Basin Plan that identifies beneficial uses of water and water quality objectives to protect those beneficial uses, while acknowledging that water quality may be changed to some degree without unreasonably affecting beneficial uses. Basin Plans form the regulatory basis for meeting state and federal water quality requirements. Changes in water quality are allowed if the change does not impact the most strict beneficial use specified for the water body, does not unreasonably affect the present or anticipated beneficial uses, and does not result in water quality less than that prescribed in the water quality control plans. The proposed project area lies within the jurisdiction of the RWQCB-Los Angeles Region (RWQCB-LA).

16.3.6 Los Angeles Regional Water Quality Control Plan (Basin Plan)

Under the PCA, the SWRCB and the RWQCB-LA share the responsibility for establishing water policies and plans and implementing measures to fulfill CWA requirements. The RWQCB-LA adopted the Basin Plan in 1994 (with updates in 2011), which identifies beneficial uses for the washes and rivers in the proposed project area. Beneficial land uses in SCR Reaches 4A, 4B, 5, and 6 are identified in Table 16-3. The Basin Plan is designed to preserve and enhance water quality and protect the beneficial uses of all regional waters. Specifically, the Basin Plan (1) designates beneficial uses for surface and ground waters, (2) sets narrative and numerical objectives that must be attained or maintained to protect the designated beneficial uses and conform to the state's anti-degradation policy, and (3) describes implementation programs to protect all waters in the Los Angeles Region. In addition, the Basin Plan incorporates (by reference) all applicable state and RWQCB plans and policies and other pertinent water quality policies and regulations. The Basin Plan is reviewed and updated as necessary to reflect changing regulations, watershed conditions, and best management practices (BMPs).

Table 16-3. Beneficial Use Designations for Water Bodies in the Project Area

	Water Body			
Beneficial Use	**SCR Reach 4A**	**SCR Reach 4B**	**SCR Reach 5**	**SCR Reach 6**
Municipal and Domestic Supply (MUN)	P*	P*	P*	P*
Agriculture Supply (AGR)	E	N/A	N/A	N/A
Industrial Service Supply (IND)	E	E	E	E
Industrial Process Supply (PROC)	E	E	E	E
Groundwater Recharge (GWR)	E	E	E	E
Freshwater Replenishment (FRSH)	E	E	E	E
Navigation (NAV)	N/A	N/A	N/A	N/A
Hydropower Generation (POW)	N/A	N/A	N/A	N/A
Water Contact Recreation (REC-1)	E	E	E	E
Non-Contact Water Recreation (REC-2)	E	E	E	E
Commercial and Sport Fishing (COMM)	N/A	N/A	N/A	N/A
Aquaculture (AQUA)	N/A	N/A	N/A	N/A
Wildlife Habitat (WILD)	E	E	E	E
Marine Habitat (MAR)	N/A	E	E	E
Warm Freshwater Habitat (WARM)	E	E	E	E
Cold Freshwater Habitat (COLD)	N/A	N/A	N/A	N/A
Inland Saline Water Habitat (SAL)	N/A	N/A	N/A	N/A
Estuarine Habitat (EST)	N/A	N/A	N/A	N/A
Preservation of Rare and Endangered Species (RARE)	E	E	E	E
Wetland Habitat (WET)	E	E	E	E
Migration of Aquatic Organisms (MIGR)	E	E	N/A	N/A
Spawning, Reproduction, and/or Early Development (SPWN)	N/A	N/A	N/A	N/A

N/A = not applicable
E = existing beneficial use
P* = potential beneficial uses; asterisked MUN designations are designated under SB 88-63 and RB 89-03. Some designations may be considered for exemption at a later date (see pages 2-3 and 2-4 of the RWQCB-LA Basin Plan [2011] for more details).
Source: RWQCB-LA Basin Plan 2011.

16.4 ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

16.4.1 Thresholds of Significance

The criteria used to determine the significance of impacts related to hydrology and water quality are based on Appendix G of the CEQA Guidelines. The proposed project would result in a significant impact if it would result in any of the following:

- Violate any water quality standards or waste discharge requirements or otherwise substantially degrade water quality.

- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level that would not support existing land uses or planned uses for which permits have been granted).

16.4.2 Methodology

The GSWIM was developed for the SCVSD to evaluate TMDL compliance alternatives. The analysis herein uses the GSWIM to evaluate potential effects to flows in the SCR and groundwater levels in the Santa Clara River Valley from implementation of the proposed project. In particular, the model was used to simulate (1) the effect of reduced discharges from the VWRP and SWRP on river surface flows and groundwater levels, and (2) the effect of the salt management facilities for Phase I of Alternative 4 on groundwater levels in the Piru Subbasin.

The GSWIM is a numerical model that simulates groundwater and surface water flow conditions in the SCR based on data collected from 1975 to 2005. The GSWIM was developed using a code called MODHMS (CH2M-HGL 2006), based on the U.S. Geological Survey (USGS) Modflow model – a modular, three-dimensional, finite-difference groundwater flow model (McDonald and Harbaugh 1988). MODHMS includes numerous features that were not included in the original USGS Modflow code. MODHMS is a physically-based, spatially-distributed, numerical model that includes several packages for simulation of fully integrated groundwater and surface water flow (including saturated and unsaturated flow) and solute transport.

GSWIM development began with a conceptual model of the East and Piru Subbasins as described in CH2M-HGL (2006). The following GSWIM model development description is summarized from CH2M-HGL (2008). The model is populated with boundary conditions, topography, and parameters describing climate, hydraulic and flow conditions, storage, ET, and chloride concentrations. The model is then calibrated, a process that "tunes" the model to simulate observed surface water and groundwater conditions. This process generally involves adjusting model parameters and boundary conditions to produce model results that match actual observed conditions.

In order to evaluate future conditions, future plans for land and water use are included as assumptions in the model. Although it is not possible to predict future land and water use conditions with certainty, the future assumptions were developed collaboratively with input from the Groundwater-Surface Water Interaction Technical Working Group (GSWI TWG) that includes various stakeholders. The baseline groundwater levels and surface water flow rates are based on 2011 conditions. The input for future climate conditions were assumed to have the same local hydrologic and climate sequences as historically occurred from 1975 to 1998. This period of time contains wet, normal, and dry periods, including the 1976-1977 drought, and is thus considered a reasonable range of conditions for evaluating future effects.

Three GSWIM simulations were prepared for this Draft EIR. The first model run uses the combined 2011 discharge from the VWRP and SWRP (19.5 mgd) to provide a baseline or "without project" condition. The second simulation uses a combined discharge from the VWRP and SWRP of 13 mgd, which is the proposed minimum flow required to protect biological resources (see Section 11). A summary report of the two runs is included in Appendix 16-A (ESA 2012). The third run simulated groundwater level changes assuming the operation of the salt management facilities in the Piru Subbasin at an extraction rate of 15,500 gpm (22 mgd), which is the average rate required to produce a blend water with 95 mg/L chloride, as part of Alternative 4, coupled with the proposed minimum flow of 13 mgd from the VWRP and SWRP. Graphical outputs of this model run are included in Appendix 16-A (AMEC 2012; AMEC 2013).

A comparison of results from model runs one and two illustrate the level of impact that a reduction in discharge would have on surface flows and groundwater levels. A comparison of results from model runs one and three illustrates the combined impact that a reduction in WRP discharge and operation of the salt management facilities would have on groundwater levels. The results of these model runs are discussed in greater detail in Section 16.4.3.2.

16.4.3 Impact Analysis

16.4.3.1 Violation of Water Quality Standards

Impact 16-1: The proposed project could violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade water quality.

Alternative 1 – MF/RO With Brine Disposal via Pipeline

MF/RO and UV Disinfection Facilities

The microfiltration/reverse osmosis (MF/RO) facilities at the VWRP and the potential ultraviolet (UV) disinfection facilities at the VWRP and/or SWRP are described in Section 6.7.1. The proposed project would require earthwork activities such as grading, stockpiling of soils, and excavation. Construction of the facilities would occur within the fully developed WRPs. Construction equipment requires the use and handling of chemicals such as oil, fuels, lubricants, and possibly cleaning solvents. In the event of an accidental release of chemicals, e.g., spills during fueling of equipment, the chemicals could flow into nearby water bodies and affect surface water quality or percolate into the soil and affect groundwater quality. In addition, the construction activities would disturb surface soils that would potentially be exposed to the effects of wind and water erosion and could cause sedimentation in stormwater runoff.

Prior to the start of proposed project construction, the SCVSD would obtain coverage under the NPDES General Construction Permit if the particular construction project is greater than 1 acre in size. In order to conform to the requirements of the NPDES Construction General Permit, a Stormwater Pollution Prevention Plan (SWPPP) would be prepared. An SWPPP identifies potential pollutant sources (such as sediment) and specifies BMPs to prevent construction pollutants from causing a violation of any water quality standards. Even if not required to obtain coverage under the NPDES General Construction Permit, the SCVSD or its contractor would prepare and implement a Drainage Control and Pollution Prevention Plan (DCPPP). A DCPPP is similar to a SWPPP in that it identifies potential pollutant sources and specifies BMPs. Implementation of an SWPPP or DCPPP would minimize construction-related impacts due to stormwater and prevent violations of water quality standards or waste discharge requirements. Impact would be less than significant.

The MF/RO and UV disinfection facilities would not substantially increase stormwater runoff. The MF/RO and UV disinfection facilities would be constructed within a disturbed area of the VWRP and would have the potential to increase runoff from new impervious surfaces. However, this area is a relatively small percentage of the VWRP property and any additional runoff would be collected by the existing stormwater collection system at the VWRP. The SWRP is entirely paved and the addition of the UV disinfection facilities would not increase impervious areas with the SWRP. As a result, the proposed project components would not cause an appreciable impact to the quality or quantity of runoff or violate applicable water quality standards. Impact would be less than significant.

The SCR does not consistently meet the Basin Plan water quality objective for chloride. As a result, the RWQCB established a TMDL for chloride in the USCR. The purpose of the MF/RO and UV disinfection facilities would be to reduce the chloride level in the recycled water prior to discharge to the SCR. The average chloride concentration in the discharge water from the VWRP and SWRP in 2010 was 128 mg/L. This chloride concentration meets the interim chloride limits but exceeds the chloride limit of 100 mg/L in the Chloride TMDL that will become effective in 2015. With implementation of the proposed project, the chloride concentration in the discharge from both WRPs would be reduced to less than 100 mg/L. As a result, the implementation of the proposed project would result in a benefit to water quality and would enable compliance with the chloride limit in the Chloride TMDL. Impact would be less than significant.

RO Product Water Conveyance System to SWRP

The RO product water conveyance system facilities are described in Section 6.7.1. Construction of the RO product water pipeline would require trenching and backfilling. Construction of the RO product water pump station could impact water quality through the accidental release of chemicals or addition of sediment to stormwater runoff. However, implementation of an SWPPP or DCPPP would minimize construction-related impacts to stormwater and prevent violations of water quality standards or waste discharge requirements. Impact would be less than significant.

Operation of the RO product water pipeline would not increase impervious surfaces since the pipeline would be located underground and within existing public right-of-way (ROW) to the maximum extent practicable. The RO product water pump station would be constructed within a disturbed area of the VWRP and would have the potential to increase runoff from new impervious surfaces. However, this area is a relatively small percentage of the VWRP property and any additional runoff would be collected by the existing stormwater collection system at the VWRP. Impact would be less than significant.

Brine Disposal System (Pipeline to JOS)

The brine disposal system facilities are described in Section 6.7.1. The 37-mile long brine disposal pipeline would require trenching, backfilling, and drilling activities. The brine disposal pipeline would be constructed underground and within existing public ROW to the maximum extent practicable. Construction of the brine disposal pipeline and the VWRP and offsite brine disposal pipeline pump stations could impact water quality through the accidental release of chemicals or pollution in stormwater runoff. However, implementation of an SWPPP or DCPPP would minimize construction-related impacts to stormwater and prevent violations of water quality standards or waste discharge requirements. Impact would be less than significant.

Operation of the brine disposal pipeline would not increase impervious surfaces since the pipeline would be located underground and within existing public ROW to the maximum extent practicable. The VWRP and offsite brine disposal pipeline pump stations would have a footprint of approximately 100 feet by 100 feet that would largely be impervious and could increase stormwater runoff. However, the VWRP and offsite brine disposal pipeline pump station pads would be designed to convey surface runoff to the nearest storm drain. The drainage patterns on the site would not result in substantial erosion or surface runoff. Impact would be less than significant.

The proposed project would contribute approximately 1.3 million gallons per day (mgd) of brine to the Sanitation Districts' Joint Outfall System (JOS) and eventually to the Sanitation Districts' Joint Water Pollution Control Plant (JWPCP) in the City of Carson. The JOS is a large network of trunk sewers and wastewater treatment plants. The JWPCP already receives wastewater with higher levels of salt and has an ocean outfall to convey treated wastewater to the ocean. The JWPCP treated an annual average of 273 mgd of municipal wastewater in 2011. Addition of SCVSD brine to the JWPCP would increase effluent chloride levels by less than 0.5 percent. No additional treatment systems would be needed at the JWPCP to accommodate the SCVSD brine. The addition of SCVSD brine would not result in exceedances of the JWPCP's effluent permit limits. Impact would be less than significant.

Impact Summary

The construction and operation of Alternative 1 would not violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade water quality. The construction and operational impact would be less than significant.

Mitigation Measures: None Required.

Significance Level After Mitigation: Less Than Significant Impact.

Alternative 2 – MF/RO With Brine Disposal via DWI

MF/RO and UV Disinfection Facilities

The MF/RO facilities at the VWRP and the potential UV disinfection facilities at the VWRP and/or SWRP would be the same as described for Alternative 1. Impact would be less than significant.

RO Product Water Conveyance System to SWRP

The RO product water conveyance system facilities would be the same as described for Alternative 1. Impact would be less than significant.

Brine Disposal System (DWI)

The brine disposal system facilities are described in Section 6.7.1. The deep well injection (DWI) brine pipeline would be constructed underground and within existing public ROW to the maximum extent practicable. The DWI pump station would be located at the VWRP, and the injection wells would be located at the DWI site. Construction of the brine disposal system facilities could impact water quality through the accidental release of chemicals or pollution in stormwater runoff. However, implementation of an SWPPP or DCPPP would minimize construction-related impacts to stormwater and prevent violations of water quality standards or waste discharge requirements. Impact would be less than significant.

The brine would be disposed of via deep injection wells. If this brine were to be injected into a freshwater aquifer, the brine would degrade the water quality and potentially exceed water quality standards. As discussed in Section 6.6.2, the screened portion of the brine injection wells would be 7,000 to 12,000 feet below ground surface into a formation with high salinity water that is not suitable as potential drinking water. See Section 14 for additional discussion of DWI and water quality. No impact would occur.

Impact Summary

The construction and operation of Alternative 2 would not violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade water quality. The construction and operational impact would be less than significant.

Mitigation Measures: None Required.

Significance Level After Mitigation: Less Than Significant Impact.

Alternative 3 – MF/RO With Brine Disposal via Trucking

MF/RO and UV Disinfection Facilities

The MF/RO facilities at the VWRP and the UV disinfection facilities at the VWRP and SWRP would be the same as described for Alternative 1. Impact would be less than significant.

RO Product Water Conveyance System to SWRP

The RO product water conveyance system facilities would be the same as described for Alternative 1. Impact would be less than significant.

Brine Disposal System (Trucking)

The brine disposal system facilities are described in Section 6.7.1. Construction of the truck loading terminal would be on undeveloped land to the north of the VWRP and the truck unloading terminal would be located within an existing industrial area in the City Terrace area of Los Angeles County. Construction of the brine disposal system facilities could impact water quality through the accidental release of chemicals or pollution in stormwater runoff. However, implementation of an SWPPP or DCPPP would minimize construction-related impacts to stormwater and prevent violations of water quality standards or waste discharge requirements. Impact would be less than significant.

The operation of the truck loading terminal would not substantially increase stormwater runoff. The truck loading terminal would be constructed on an undisturbed area north of the VWRP and would have the potential to increase runoff from that area. However, this area is relatively small when compared to the overall size of the VWRP property. Surface run-off produced as a result of the new impervious surface would be captured and conveyed to a stormwater drainage system. The truck unloading terminal would be located within a disturbed area. As a result, the truck unloading terminal would not contribute to a new source of erosion or surface runoff. The proposed project would not cause an appreciable impact to the quality or quantity of runoff from either the truck loading or unloading terminal and would not violate applicable water quality standards. Impact would be less than significant.

Based on the anticipated brine concentrations, the brine would be considered a non-hazardous liquid waste. The transportation would be performed in accordance with United States Department of Transportation (USDOT) regulations covering the transportation of waste liquids.

Within California, the state agencies with primary responsibility for enforcing federal and state regulations, and for responding to transportation emergencies, are the California Highway Patrol (CHP) and the California Department of Transportation (Caltrans). Together, federal and state agencies determine driver training requirements, load labeling procedures, and container specifications. Trucks and trailers would be required to comply with specifications for containing the liquid waste, and have response plans and equipment to contain the waste in the event of a release. Compliance with these regulations would reduce the potential of an accidental release. Impact would be less than significant.

Impact Summary

The construction and operation of Alternative 3 would not violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade water quality. The construction and operational impact would be less than significant.

Mitigation Measures: None Required.

Significance Level After Mitigation: Less Than Significant Impact.

Alternative 4 – Phased AWRM

Phase I

UV Disinfection Facilities

The UV disinfection facilities at the VWRP and SWRP would be the same as described for Alternative 1. Impact would be less than significant.

Salt Management Facilities

The salt management facilities are described in Section 6.7.1. Construction of the salt management facilities could impact water quality through the accidental release of chemicals or addition of sediment to stormwater runoff. However, implementation of an SWPPP or DCPPP would minimize construction-related impacts to stormwater and prevent violations of water quality standards or waste discharge requirements. Impact would be less than significant.

Higher chloride groundwater from the East Piru well field would be extracted and blended with lower chloride groundwater from the West Piru well field and then conveyed through a blended groundwater pipeline further downstream to a location near the Fillmore Fish Hatchery at the Piru Narrows where the blended groundwater would be discharged to the river. The blended groundwater discharged to the river would comply with the Chloride TMDL. Impact would be less than significant.

Chloride levels in the Piru Basin are expected to drop with the implementation of Alternatives 1, 2, 3, or 4; however, with the implementation of Alternative 4, chloride levels would drop more quickly and dramatically. The removal of relatively high chloride groundwater from the eastern Piru Subbasin would allow natural recharge with lower chloride surface water, thereby resulting in improved groundwater quality. The blended groundwater would constitute a new, usable water supply that would offset pumping on the Oxnard Plain and reduce overdrafting and seawater intrusion associated with that pumping. In summary, the salt management facilities would have a positive impact on water quality. Impact would be less than significant.

Supplemental Water System

The supplemental water system facilities are described in Section 6.7.1. Construction of the supplemental water system facilities could impact water quality through the accidental release of chemicals or addition of sediment to stormwater runoff. However, implementation of an SWPPP or DCPPP would minimize construction-related impacts to stormwater and prevent violations of water quality standards or waste discharge requirements. Impact would be less than significant. Operation of the supplemental water pipeline would not increase impervious surfaces since the pipeline would be located underground and within existing ROW to the maximum extent practicable. Impact would be less than significant.

Impact Summary – Phase I

The construction and operation of Phase I of alternative 4 would not violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade water quality. The construction and operational impact would be less than significant.

Mitigation Measures: None Required.

Significance Level After Mitigation: Less Than Significant Impact.

Phase II

MF/RO Facilities

The MF/RO facilities at the VWRP would be similar to those described for Alternative 1 but, under this alternative, would be smaller in size. Impact would be less than significant.

RO Product Water Conveyance System to Ventura County

The RO product water conveyance system facilities are described in Section 6.7.1. Construction of the Ventura County RO product water pipeline would require trenching and backfilling. Construction of the Ventura County RO product water pump station could impact water quality through the accidental release of chemicals or addition of sediment to stormwater runoff. However, implementation of an SWPPP or DCPPP would minimize construction-related impacts to stormwater and prevent violations of water quality standards or waste discharge requirements. Impact would be less than significant.

Operation of the Ventura County RO product water pipeline would not increase impervious surfaces since the pipeline would be located underground and within existing public ROW to the maximum extent practicable. The Ventura County RO product water pump station would be located at the VWRP. The pump station pad would be designed to convey surface runoff to the nearest storm drain. The drainage patterns on the site would not result in substantial erosion or surface runoff. Impact would be less than significant.

Brine Disposal System

The brine disposal system facilities are described in Section 6.7.1. The brine disposal system would rely on a pipeline, DWI, or trucking – each of which was previously analyzed for Alternatives 1, 2, and 3, respectively, but there would be a lower peak brine flow to manage so the diameter of the pipeline, number of injection wells, and peak number of truck trips would be smaller. None of brine disposal systems would include any component that would violate applicable water quality standards or regulations. Impact would be less than significant.

Impact Summary – Phases I and II

The construction and operation of Phase I of Alternative 4 would not violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade water quality. The construction and operational impact would be less than significant.

The construction and operation of Phase II of Alternative 4 would not violate applicable water quality standards or waste discharge requirements or otherwise substantially degrade water quality. The construction and operational impact would be less than significant.

Mitigation Measures: None Required.

Significance Level After Mitigation: Less Than Significant Impact.

16.4.3.2 Deplete or Interfere with Groundwater Supplies

Impact 16-2: The proposed project could substantially deplete groundwater supplies or interfere substantially with groundwater recharge resulting in a net deficit in aquifer volume or a lowering of the local groundwater table level.

The following analysis evaluates the potential effect to the SCR surface water and groundwater resources associated with reduced discharge from the WRPs. The analysis includes an assessment of surface water effects as well as groundwater effects because the two are interconnected.

Surface Water

As discussed in Section 4, future recycled water demands in the SCV will be met using treated effluent from the SCVSD. The Castaic Lake Water Agency (CLWA) has identified demand for as much as 17,400 afy of recycled water by the year 2030 (see Section 4). The SCVSD would provide CLWA with recycled water to meet projected future demand to the extent possible. The Reduced Discharge Technical Study concluded that negligible biological impacts would occur if the volume of discharge from the VWRP was reduced to not less than 8.5 mgd, the early 1990s level (ESA 2010). As discussed in Section 4, the SCVSD has conservatively proposed a minimum discharge of 8.5 mgd (approximately 9,500 afy) from the VWRP and 4.5 mgd (approximately 5,100 afy) from the SWRP to support aquatic biological resources in the SCR. This minimum combined discharge rate of 13 mgd is equivalent to the discharge rate in the early 1990s. The SCVSD's first water reclamation plant began discharging in 1962, and flow rates have increased from the initial 0.25 mgd to where they are today.

The SCR watershed upstream of the Piru Dry Gap (USCR) has a drainage area of approximately 645 square miles, generally flowing from east to west. The principal tributaries to the SCR are mountain streams that enter from the north. Along the mountain front, these generally narrow, steep, and bedrock-confined tributaries change abruptly into alluvial channels of lesser gradient prior to merging with the SCR main channel.

The USCR has a highly variable annual flow regime strongly influenced by precipitation events. Total annual discharge volumes near the Los Angeles-Ventura County line have ranged from

560 af in water year[2] (WY) 1961 to over 250,000 af in WYs 1969 and 2005. The perennial base flow observed downstream of the SWRP is maintained by the contribution of groundwater upwelling, discharges from the VWRP and SWRP, bank seepage, and agricultural and urban runoff (including irrigation runoff).

Under current conditions, perennial surface water flow within the USCR begins at the SWRP point of discharge for about 1 mile downstream. The river then dries up again for most of the year for the short (less than 1 mile long) McBean Dry Gap (ESA 2010). Stream flow from downstream of the McBean Dry Gap to the VWRP is nearly perennial, with groundwater upwelling occurring from the confluence with the San Francisquito Creek to beyond the VWRP (ESA 2010). Groundwater upwelling contributes to SCR base flow in this area because of two geologic conditions. Groundwater flowing from east to west is forced under artesian pressure to rise (upwell) to the surface, feeding the river beginning at the western end of the McBean Dry Gap. In addition, downstream near Blue Cut, bedrock becomes less deep, leading to thinning alluvium that also forces groundwater to the surface and results in a gaining river (ESA 2010). Once flow passes Blue Cut, the depth of permeable sediments quickly increases and the canyon widens. This condition results in a much larger volume of permeable sediments just downstream of the Blue Cut constriction, and surface water infiltrates into the subsurface in this losing stream portion of the SCR. Seasonally, the volume of surface water is insufficient to maintain surface water flow, thus resulting in the Piru Dry Gap. The Piru Dry Gap provides separation of the surface flow between the USCR and Lower SCR all year except during and immediately after storm events. However, groundwater flows continue to contribute to the Piru Subbasin from the East Subbasin.

At the western end of the Piru Dry Gap within the eastern Fillmore Subbasin, surface flow reappears due to rising groundwater. The annual SCR surface water flow from the Piru Subbasin to the Fillmore Subbasin between 1975 and 2005 ranged from 0 to 422,450 af, with an annual average of 80,383 af (111 cfs).

The SCVSD has conducted an assessment of potential impacts to the USCR from reduced discharge (ESA 2010). The WRP discharges were found to have a negligible effect on sediment transport, river channel forms, or total riparian habitat area as these conditions are controlled by winter storm flows (ESA 2010). During non-storm periods, the analysis suggests that the discharges from the WRPs would have a direct effect on river flow immediately downstream of their discharge points (approximately 9 cfs), roughly commensurate to the reduced contribution from the treatment plants. However, further from the treatment plants, the effect of reduced discharges would be muted due to the contribution of groundwater to river flows. During the driest periods of the year, the discharges from the VWRP and SWRP contribute 75 to 100 percent of the flow immediately downstream of each plant, respectively. However, river flows further downstream remain relatively constant, suggesting the buffering of groundwater or other factors more significant than WRP discharge.

GSWIM simulations for surface flow assuming a discharge of 13 mgd from the SCVSD are summarized in Table 16-4. The stream gauge locations listed in Table 16-4 are shown on Figure 16-2. Comparison of the simulated surface water hydrographs for the baseline and reduced discharge scenarios reveals that surface water flows from Stream Gauge SW1 just downstream of the VWRP in the East Subbasin to downstream to the Las Brisas Bridge vary minimally. Stream Gauge SW4 just before the Piru Dry Gap indicates an average separation of

[2] A Water Year begins on October 1 of the previous year and ends on September 30 of the designated Water Year. For example, Water Year 2004 comprises October 1, 2003 through September 30, 2004.

slightly less than that of the proposed reduction in discharge. Simulated hydrographs for Gauge SW1 are presented on Figure 16-3. Simulated hydrographs for Gauge SW4 are presented on Figure 16-4. Even during extended drought conditions, the maximum difference is 13.4 cfs near the beginning of the dry gap (Gauge SW4). As previously discussed, the western portion of the East Subbasin has upwelling groundwater conditions that maintain surface water flow in this area.

Table 16-4. Summary of Surface Water Flow Rate Differences

GSWIM Stream Gauge Number	Stream Gauge Number	Average Stream Flow Difference (in cfs)	Maximum Stream Flow Difference (in cfs)	Subbasin	Location Notes
SW1	SCR-RD	9.58	10.6	East	Downstream of VWRP
SW2	SCR-RE	9.12	10.1	East	Between VWRP and Blue Cut
SW3	11108500	9.37	11.2	Piru	At Blue Cut
SW4	11109000	9.77	13.4	Piru	Before Piru Dry Gap at Las Brisas Bridge
SW5	04N18W30SW1	1.51	20.4	Piru	In Piru Dry Gap
SW6	04N19W33SW1	3.67	20.4	Fillmore	In Piru Dry Gap

Within the Piru Dry Gap (Stream Gauge SW5), the average surface water flow conditions are typically low or zero and show little to no response to the difference in discharge except for the reduction or elimination of peak flows under drought conditions. At Gauge SW6 at the western end of the dry gap within the eastern Fillmore Subbasin, surface water flows under both scenarios except for extended drought conditions. These data indicate that past the dry gap, the proposed reduction of discharge would show little effect on surface flow. As the surface water flow continues into the much larger Fillmore Subbasin, the effect of the discharge reduction would be further muted and may show little to no discernible effect.

The percentile differences for the two scenarios for all of the stream gauge locations are presented on Figure 16-5. Gauges from the East Subbasin (SW1) to just before the dry gap in Piru Subbasin (SW4) track closely together and show that, for 90 percent of the simulation period, the surface water flow differences between the two scenarios are about 10 cfs, which is also the amount of the proposed discharge reduction.

At Gauge SW5, located within the dry gap just before Piru Creek with its periodic surface water discharges from Lake Piru, zero surface water flow is the normal condition. Therefore, the percentile difference between the two scenarios is 10 cfs or less for 99 percent of the time.

Gauge SW6, located just into the Fillmore Subbasin and at the end of the dry gap, is in an area with groundwater upwelling that contributes to surface water flow; this area has zero flow for both scenarios only under drought conditions. The difference in discharge for the two scenarios is 10 cfs or less for 95 percent of the simulated period. The difference can reach as high as 20 cfs, but only for less than 5 percent of the simulation interval. These results are likely a function of rising groundwater in this area under most conditions, a larger volume of accessible groundwater in storage, and groundwater infiltration during other conditions (prolonged drought).

As mentioned earlier, the SCVSD WRPs began discharging in 1962 and reached a combined discharge of 13 mgd (the proposed minimum discharge) in the early 1990s. Therefore, flows from the WRPs have not historically contributed surface flows to the region, and discharges from the WRPs have only exceeded the proposed minimum in the past 20 years. Because the project would not reduce surface flows below historic level, impact would be less than significant.

The reduction in surface flows downstream of the Piru Dry Gap may result in less water available for diversion downstream than has been available in recent years. The current diversions in this segment of the river are described in Section 16.2.3.5. The combined reduced discharge of the WRPs would result in river flows similar to those experienced in the 1990s. As summarized in Table 16-4, the GSWIM predicts that surface water flows at Gauge SW6 would be reduced by 3.7 cfs on average. United Water has an instantaneous diversion right of 375 cfs at the Freeman Diversion located approximately 14 miles downstream from Gauge SW6 (United Water 2007). The simulated flow reduction represents 1 percent of United Water's allowed diversion rate. This slight average flow reduction would not significantly affect availability of water for diversion from the river. The Freeman Diversion Facility was constructed in 1991 to divert SCR surface water to enhance recharge of local groundwater supplies that have been affected by seawater intrusion (United Water 2012). Thus, surface water resources greater than those experienced prior to the 1990s would remain available to supply local demands.

Groundwater

Groundwater in the East Subbasin is found in the alluvium and in the deeper Saugus Formation. The combined storage volume of these water-bearing units[3] is estimated at 1,811,000 af. The western portion of the East Subbasin is in an area of groundwater upwelling, which maintains surface water flow in the SCR, even during dry periods. At the eastern edge of the Piru Subbasin, depth to bedrock begins to increase rapidly with distance to the west. Surface water in the SCR recharges into the alluvial soils at this location, resulting in a dry gap. As the depth to the bedrock stabilizes at the western edge of the Piru Subbasin and the basin narrows, upwelling occurs again and the SCR becomes a gaining stream westward through the Fillmore Subbasin.

The potential impacts to groundwater levels from the reduced discharge were modeled with GSWIM. Table 16-5 summarizes the modeled average and maximum decrease in groundwater levels for the three subbasins.

Table 16-5. Summary of Groundwater Elevation Differences

GSWIM	Average Elevation Difference (in feet)	Maximum Elevation Difference (in feet)	Subbasin	Location
GW1	<0.1	<0.1	East	Downstream of VWRP
GW2	0.1	0.2	East	
GW3	6.2	30.8	Piru	In Piru Dry Gap
GW3A	6.1	18.6	Piru	In Piru Dry Gap
GW4	6.3	19.4	Piru	In Piru Dry Gap
GW4A	4.3	13.8	Piru	In Piru Dry Gap
GW5	0.6	3.7	Fillmore	Piru Narrows

Source: SCVSD GSWIM Model 2012.

[3] For the purposes of this section, "water-bearing units" refers to geologic units that yield fresh (potable) water.

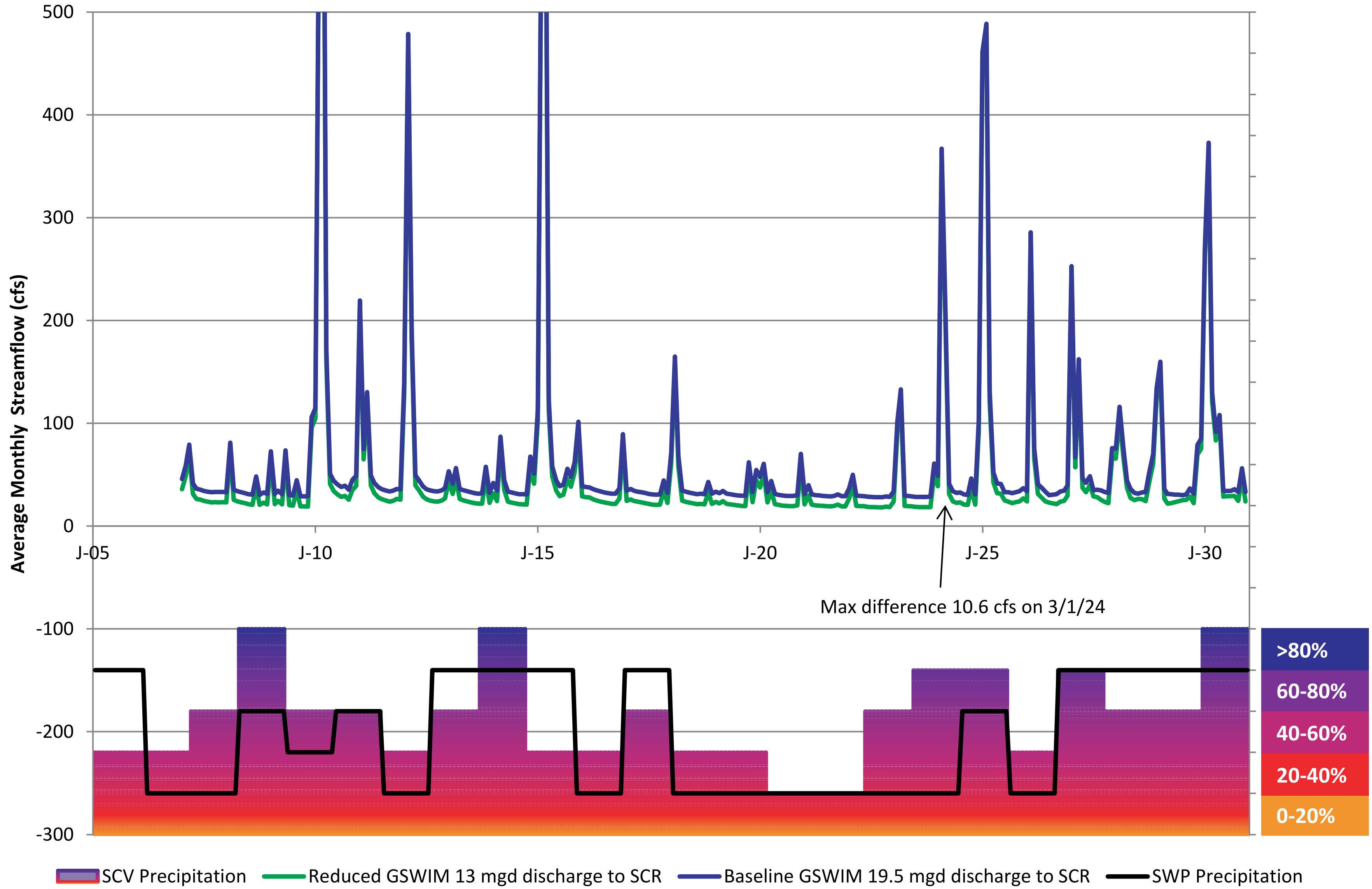

Figure 16-3

Santa Clara River Surface Water Location (SW1) Average Monthly Streamflow

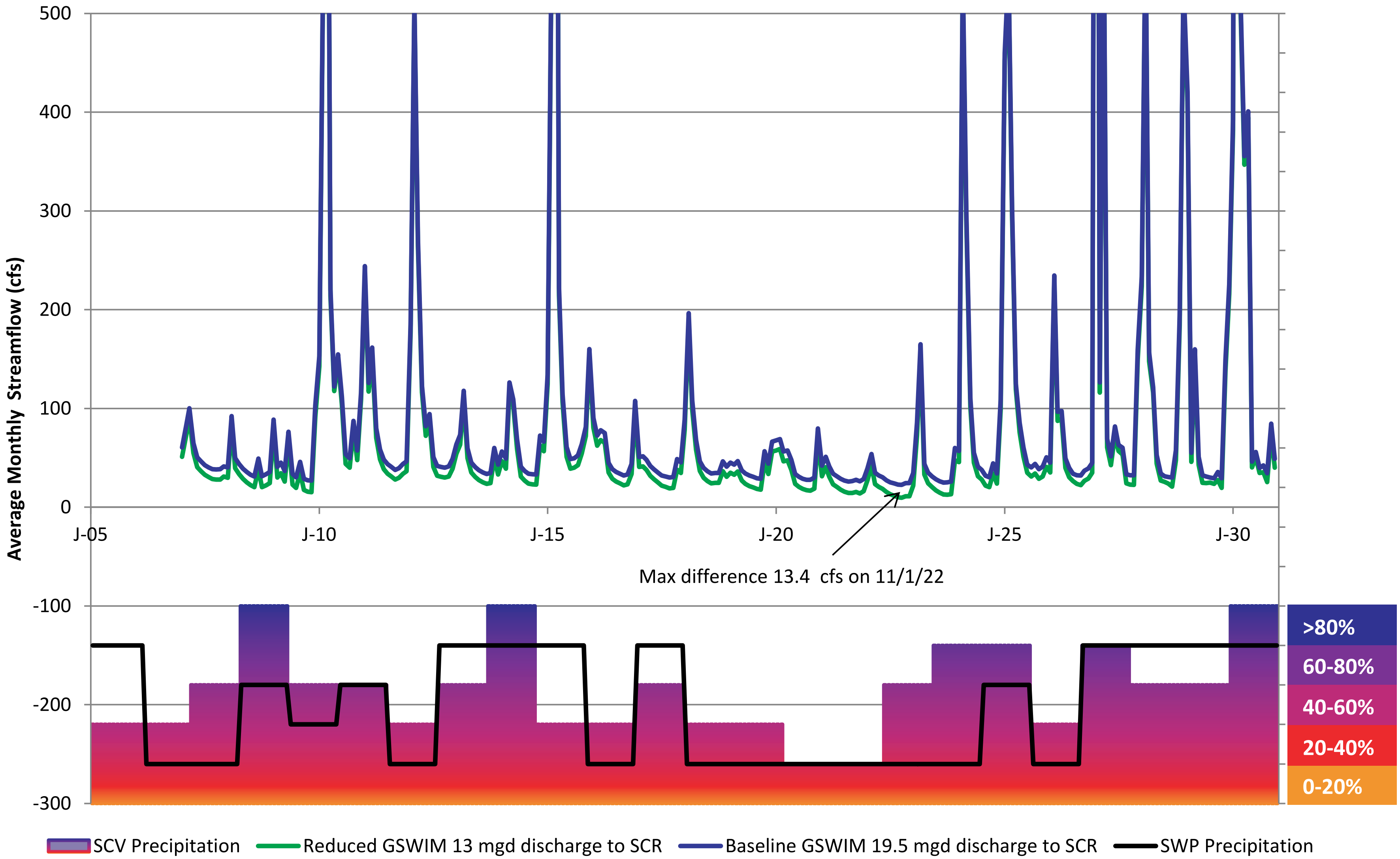

Figure 16-4

Santa Clara River Surface Water Location (SW4) Average Monthly Streamflow

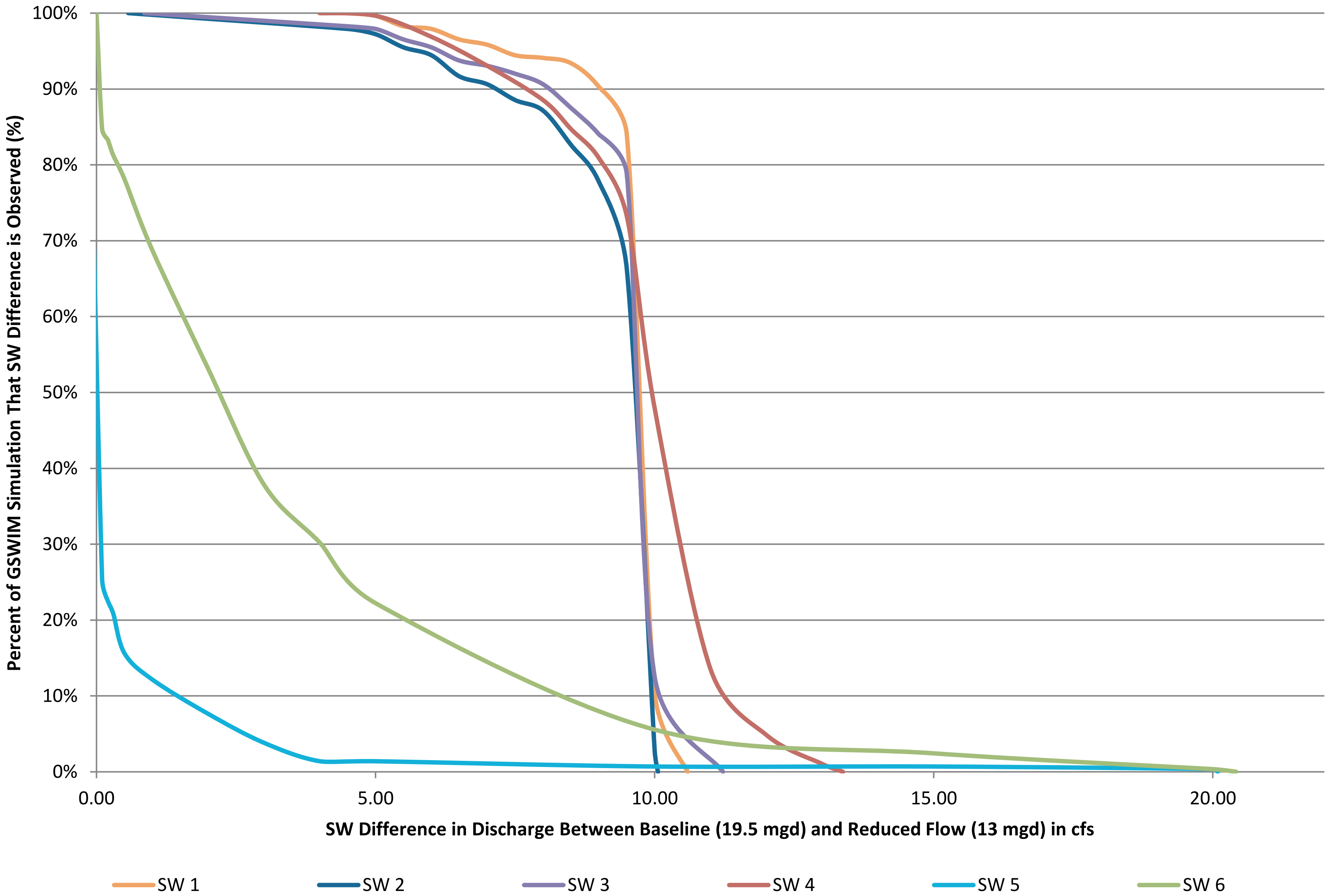

Figure 16-5

Percentile Differences at Surface Water Sampling Locations

Comparison of the simulated groundwater levels for the baseline and reduced discharge scenarios reveals very little difference for the East Subbasin wells (GW1 and GW2), even during drought conditions. As shown in Table 16-5, the average differences are <0.1 foot, with a maximum of 0.2 foot during an extended simulated drought condition. This western portion of the East Subbasin is an area of groundwater upwelling, which maintains surface water flow, even during dry periods. This indicates that the surface water discharge from the WRPs primarily flows out of the East Subbasin as surface water through Blue Cut into the Piru Subbasin, and groundwater levels in the East Subbasin are not dependent on WRP discharge flows. This is further supported by comparing the volume of the proposed reduction in discharge of 6.5 mgd (7,284 af) to the volume in storage in the East Subbasin alluvium (161,000 af), Saugus Formation (1,650,000 af), and their combined volume of 1,811,000 af. The proposed discharge reduction represents a small fraction of the groundwater in storage at 5 percent of the alluvial aquifer, 0.4 percent of the Saugus Formation, and 0.4 percent of the combined total volume.

For wells in the Piru Subbasin (GW3, GW3A, GW4, and GW4A), the simulated groundwater levels for the two scenarios are similar during normal and wet climate periods. The reduced discharge would result in an average lower groundwater level in the Piru Subbasin of 4.3 to 6.3 feet. However, during extended dry periods, the reduced discharge results in maximum groundwater level reductions of 13.8 to 30.8 feet. The predicted levels for Gauge GW3 that illustrate groundwater levels recovering when normal to wet conditions return are shown on Figure 16-6. The maximum drawdown of 30.8 feet below the baseline condition would be temporary and groundwater levels would fully recover after the drought period.

The lowered groundwater levels are attributable to drought conditions. Current discharges are considerably higher than under historical and natural conditions. Well pumps are typically set well below historical dry period groundwater levels to prevent exposure of the pump intake to air. Because the lowest historical groundwater levels precede discharges from the WRPs, it is unlikely that well pumps will be exposed. Access to groundwater in this location would be similar to the baseline condition, subject to the variability of drought and wet years. An average groundwater level decline of 6.33 feet would not be considered significant due to the natural variability in groundwater levels. Therefore, the proposed project would not significantly reduce access to groundwater in the Piru Subbasin.

As shown on Figure 16-7, the groundwater levels for the two scenarios in the Fillmore Subbasin (GW5) show little difference, reacting in a manner similar to the East Subbasin. The average difference is also small at 0.6 foot. GW5 does show a response to drought conditions, but the volume of the response is much smaller than for wells in the Piru Subbasin, with a maximum difference of 3.7 feet. This amount of groundwater level decrease would not be expected to drop groundwater levels to below the depth of well pumps. As with the other subbasins, groundwater levels recover quickly once normal to wet conditions return. This area around Fillmore is also known to be an area of groundwater upwelling. Therefore, the impact on groundwater supply in the Fillmore Subbasin would be less than significant.

In all of the subbasins, groundwater levels recover quickly, typically within 1 to 2 years after an extended drought. Overall, the GSWIM results show that fluctuations in groundwater well elevations observed in the East, Piru, and Fillmore Groundwater Subbasins are generally correlated with long term climatic conditions, with the response in the narrower Piru Subbasin larger due to its more restricted configuration. Once groundwater flow reaches the Fillmore Subbasin, the average overall effect to groundwater levels from the reduction in discharge is much reduced and an even smaller effect is likely to be felt further west as flow from the Piru Subbasin becomes a smaller percentage of the overall watershed input. For most climate conditions, the groundwater level decrease would be on the order of only a few feet and would thus be unlikely to drop to below well screens or pump intakes. Only during extended drought conditions would the decrease in groundwater levels potentially be on the order of up to about 15 to 30 feet and only for wells in the Piru Subbasin. However, well pumps are typically set well below dry season groundwater levels to protect the well pumps.

The reduction of inflow to the Fillmore Subbasin would be minor compared to the overall volume of groundwater in storage in the Fillmore Subbasin and in the downstream subbasins. An average 6.5 mgd reduction equates to approximately 7,500 afy. The Fillmore Subbasin holds approximately 7,330,000 af in storage. The reduction of 7,500 afy (approximately 0.1 percent) would not be sufficient to affect groundwater gradients or the eventual interface with brackish seawater more than 30 miles downgradient from the East Subbasin. Furthermore, the lower subbasins refill during wet years and make up for drops in groundwater levels during dry years as seen in the GSWIM results. The lower subbasins are used extensively to support overlying land uses including agriculture and municipal demands. These activities constitute the dominant effect to groundwater gradients, levels, and the interface with seawater near the ocean.

Under Phase I of Alternative 4, 11 groundwater extraction wells would be installed in the Piru Subbasin. Groundwater extracted from these wells would be discharged into the SCR at the western edge of the Piru Subbasin near the Fillmore Fish Hatchery. The addition of the 11 groundwater extraction wells in the Piru Subbasin would lower groundwater levels in the vicinity of the well fields. If groundwater levels in neighboring wells declined enough to expose well pumps, these neighboring wells could become inoperative.

The GSWIM was used to estimate the extent of the groundwater level drawdown in the vicinity of the proposed well fields (GWSIM 2013) due to a combined reduced WRP discharge of 13 mgd and the proposed extraction well fields in the Piru Subbasin. The GSWIM generated groundwater levels over time for 18 wells located within the Piru Subbasin (see Appendix 16-A).

The baseline and with project scenarios are almost the same during normal and wet climate conditions and it is only during extended drought periods when a difference is discernible. The drawdown differences are largest in the vicinity of the extraction well fields with a maximum drawdown of 70.2 feet just upgradient of the East Piru Well Field occurring during a prolonged drought period as shown on Figure 16-8 (simulated groundwater levels for Gauge GW4). This maximum drawdown would occur after 3 dry years near the cone of depression of the well field. The extent of drawdown diminishes with distance from the cone of depression caused by the extraction well fields. This is shown on the hydrograph on Figure 16-9 for groundwater point GW5 at the Fillmore Subbasin. As surface water and groundwater continue to flow further downstream into the Fillmore Subbasin and the subbasins beyond, the effect of the drawdown would dissipate entirely. In all scenarios, groundwater levels recover quickly after the return of normal to wet climate conditions.

Alternative 1 – MF/RO With Brine Disposal via Pipeline

MF/RO and UV Disinfection Facilities

The MF/RO facilities at the VWRP and the potential UV disinfection facilities at the VWRP and/or SWRP are described in Section 6.7.1. Construction of the MF/RO facilities would increase the amount of impervious surfaces at the VWRP by approximately 0.5 acre. This area is a small percentage of the VWRP property, insignificant compared to the size of the nearby drainage area, and would not substantially impact groundwater recharge. In addition,

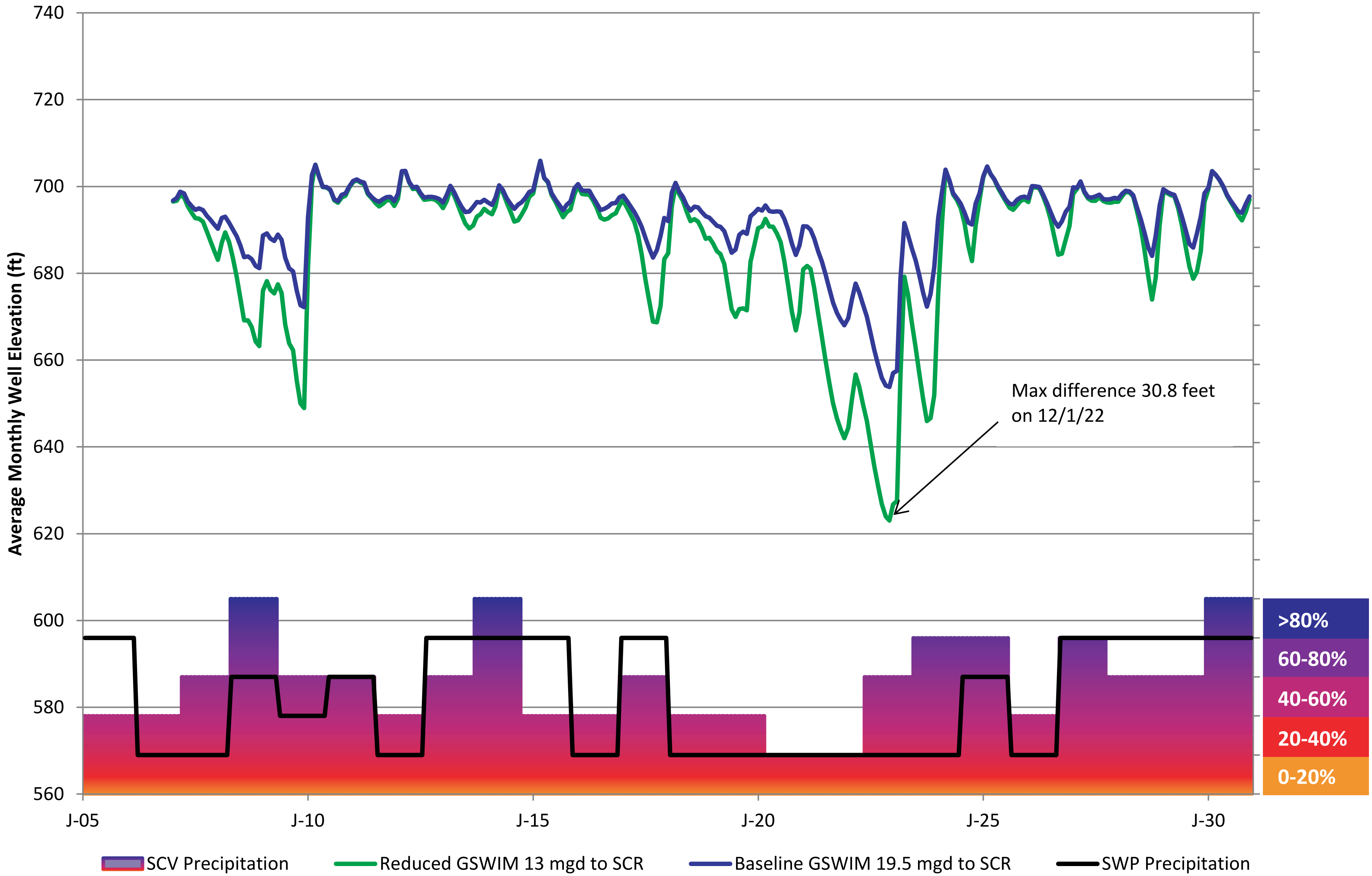

Figure 16-6

Piru Subbasin Groundwater Location (GW3) Average Monthly Well Elevation

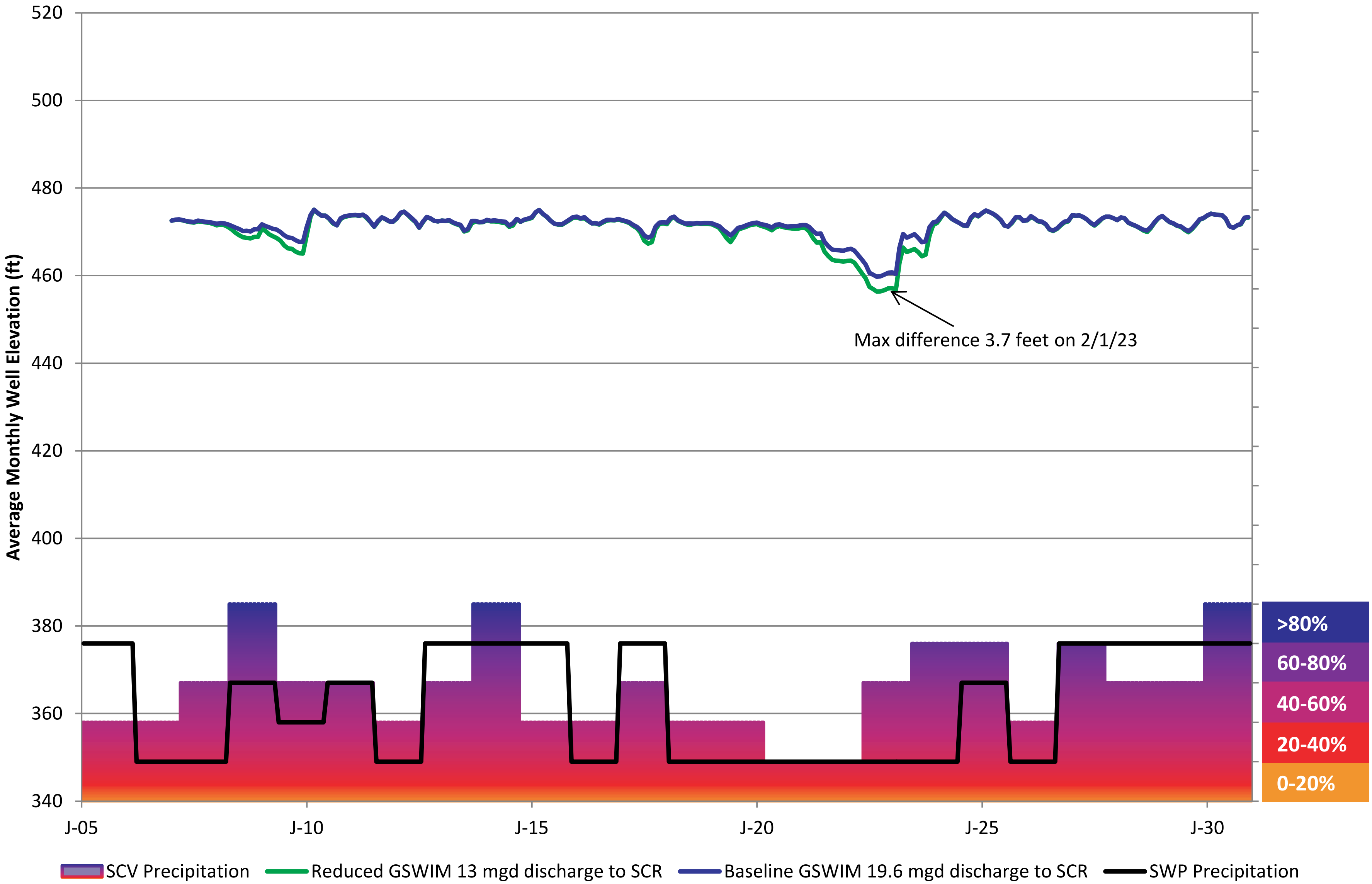

Figure 16-7

Fillmore Subbasin Groundwater Location (GW5) Average Monthly Well Elevation

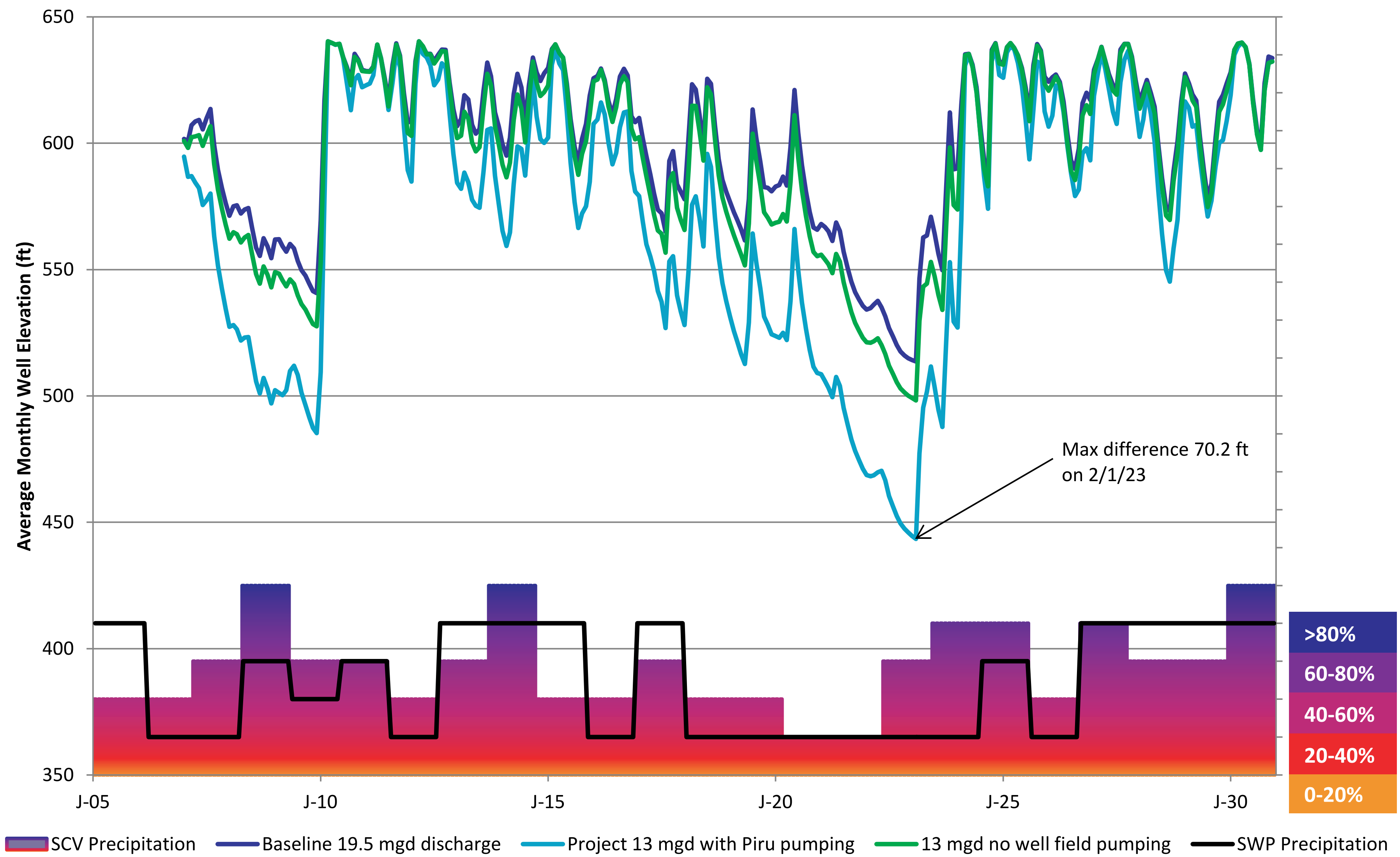

Figure 16-8

Piru Subbasin Groundwater Location (GW4) Average Monthly Well Elevation with Piru Pumping

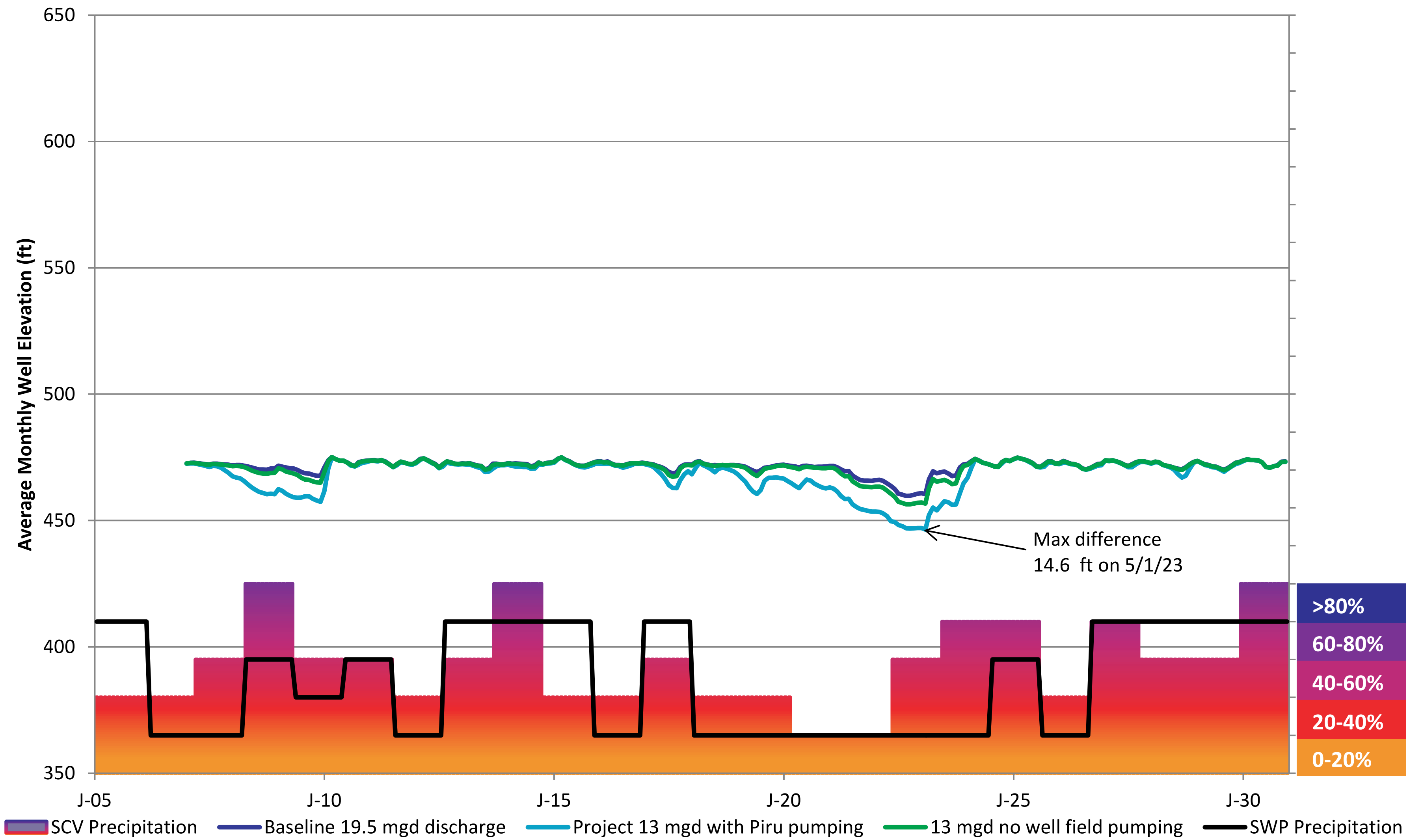

Figure 16-9

Fillmore Subbasin Groundwater Location (GW5) Average Monthly Well Elevation with Piru Pumping construction of the new facilities would not include any components that would deplete groundwater supplies or interfere with groundwater recharge. Impact would be less than significant.

RO Product Water Conveyance System to the SWRP

The RO product water conveyance system facilities are described in Section 6.7.1. The RO product water pump station would have a small footprint and would likely be constructed in an already paved area. Even if constructed in a currently unpaved area, paving this area would result in a minimal impact to groundwater recharge. The RO product water conveyance pipeline would be constructed underground within the public ROW to the maximum extent practicable. The pipeline does not include any component that would deplete groundwater supplies or interfere with groundwater recharge. Impact would be less than significant.

Brine Disposal System (Pipeline to JOS)

The brine disposal system facilities are described in Section 6.7.1. The brine disposal pipeline would be constructed underground within public ROW to the maximum extent practicable. The brine disposal pipeline does not include any component that would deplete groundwater supplies or interfere with groundwater recharge. Impact would be less than significant.

Operation of the brine disposal system would reduce discharge to the SCR. As described in the previous discussion regarding the reduced discharges from the WRPs, such reduction would not significantly impact surface water flows and groundwater supplies. Impact would be less than significant.

Impact Summary

The construction and operation of Alternative 1 would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. The construction and operational impact would be less than significant.

Mitigation Measures: None Required.

Significance Level After Mitigation: Less Than Significant Impact.

Alternative 2 – MF/RO With Brine Disposal via DWI

MF/RO and UV Disinfection Facilities

The MF/RO facilities at the VWRP and the potential UV disinfection facilities at the VWRP and/or SWRP would be the same as described for Alternative 1. Impact would be less than significant.

RO Product Water Conveyance System to the SWRP

The RO product water conveyance system facilities would be the same as described for Alternative 1. Impact would be less than significant.

Brine Disposal System (DWI)

The brine disposal system facilities are described in Section 6.7.1. The DWI site would have a small footprint and paving this area would result in a minimal impact to groundwater recharge. The DWI pump station would have a small footprint and would likely be constructed in an already paved area. The DWI brine pipeline would be constructed underground within public ROW to the maximum extent practicable. The DWI brine pipeline does not include any component that would deplete groundwater supplies or interfere with groundwater recharge. No fresh water would be pumped and there would be no reduction to water supplies as a result of brine disposal. Impact would be less than significant.

Impact Summary

The construction and operation of Alternative 2 would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. The construction and operational impact would be less than significant.

Mitigation Measures: None Required.

Significance Level After Mitigation: Less Than Significant Impact.

Alternative 3 – MF/RO With Brine Disposal via Trucking

MF/RO and UV Disinfection Facilities

The MF/RO facilities at the VWRP and the UV disinfection facilities at the VWRP and SWRP would be the same as described for Alternative 1. Impact would be less than significant.

RO Product Water Conveyance System to the SWRP

The RO product water conveyance system facilities would be the same as described for Alternative 1. Impact would be less than significant.

Brine Disposal System (Trucking)

The brine disposal system facilities are described in Section 6.7.1. No fresh water would be pumped and there would be no reduction to water supplies as a result of brine disposal. Impact would be less than significant.

Impact Summary

The construction and operation of Alternative 3 would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. The construction and operational impact would be less than significant.

Mitigation Measures: None Required.

Significance Level After Mitigation: Less Than Significant Impact.

Alternative 4 – Phased AWRM

Phase I

UV Disinfection Facilities

The UV disinfection facilities at the VWRP and SWRP would be the same as described for Alternative 1. Impact would be less than significant.

Salt Management Facilities

The salt management facilities are described in Section 6.7.1.

Surface Water

The proposed project would discharge up to 30 mgd (approximately 45 cfs) into the river at the western edge of the Piru Subbasin. Assuming an average annual flow of 111 cfs in this portion of the SCR, this would constitute an increase of approximately 40 percent compared to the average annual flow rate. The additional water would be diverted downstream prior to reaching the ocean. Velocity dissipaters would be installed to prevent scouring at the point of discharge. This magnitude of discharge would slightly alter the primary flow channels and braiding currently in the river below the Fillmore Narrows and slightly broaden and deepen the river in this segment upstream of the Freeman Diversion compared to existing conditions. However, the morphology of the river is controlled by winter storm flows. The existing channel has substantial capacity and the additional flows would not increase flood risk or adversely affect the surface water beneficial uses. Impact would be less than significant.

Groundwater

Under Phase I of Alternative 4, 11 wells would be installed in the Piru Subbasin. Groundwater extracted from these wells would be discharged to the SCR at the western edge of the Piru Subbasin. Operation of the 11 groundwater extraction wells would lower groundwater levels in the vicinity of the well fields. If groundwater levels in neighboring wells declined enough to expose well pumps, these neighboring wells could be made inoperative. The predicted impacts of pumping groundwater on groundwater levels are discussed at the beginning of this section.

Impacts to neighboring wells could include (1) increased energy requirements to lift groundwater, and (2) exposed pumps and well screens that make the well inoperable. These impacts would be considered significant if not mitigated. Implementation of Mitigation Measures HYDRO-1 and HYDRO-2 would ensure that existing and future wells in the vicinity of the proposed well fields would not be significantly impacted by the proposed project. The measures would establish a groundwater management plan and a water supply reliability program. Implementation of Mitigation Measures HYDRO-1 and HYDRO-2 would reduce the impact to a less than significant level.

Supplemental Water System

The supplemental water system facilities are described in Section 6.7.1. The supplemental water system would include the use of existing or new wells operated by CLWA. The proposed project would not result in increased use of these wells, but rather would operate them for different purposes (as dilution water), during which time CLWA would supplement their water demands with imported surface water. Operation of these wells for the proposed project in terms of groundwater level drawdown would be similar to their use without the proposed project. The supplemental water pipeline would be constructed underground within the public ROW. Impacts to surface water flows and groundwater supplies would be less than significant.

Impact Summary – Phase I

The construction of Phase I of Alternative 4 would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. The operation of the East and West Piru well fields could substantially deplete groundwater supplies or interfere substantially with groundwater recharge. Implementation of Mitigation Measures HYDRO-1 and HYDRO-2 would reduce the impact to a less than significant level.

Mitigation Measures: Implement HYDRO-1 and HYDRO-2.

Mitigation Measure HYDRO-1: Groundwater Management Plan. Prior to operating the well fields within the Piru Subbasin, a groundwater management plan shall be prepared and implemented that shall be compatible with the Assembly Bill 3030 Groundwater Management Plan for the Piru and Fillmore Basins. The objective of the plan shall be to operate the well fields such that groundwater depths do not exceed historic maximum levels. However, future studies may indicate that operation of the well fields to exceed historic groundwater levels for limited periods of time may be desirable in meeting the goal of chloride extraction. The plan shall be developed by the well field operator and multiple opportunities for public input shall be provided prior to finalization. Public input shall include at least two workshops, one during business hours and another outside of business hours. The plan shall:

- Identify the number, location, and depth of monitoring wells to surround the production well fields.
- Identify monitoring frequency and data tracking procedures.
- Provide actions that will be implemented if groundwater depths exceed historic depths for sustained periods of time. These actions could include potential reduction of extraction rates.

Mitigation Measure HYDRO-2: Water Supply Reliability Program. Prior to operating the well fields within the Piru Subbasin, a water supply reliability program shall be prepared to allow persons pumping water from the Piru Subbasin to make claims for alleged decreases in groundwater production yield, significantly increased pumping cost, or other impacts from operation of the well fields. The program shall be developed by the well field operator and multiple opportunities for public input shall be provided prior to the finalization of the program. Public input shall include at least two workshops, one during business hours and another outside of business hours. The program shall include:

- Notification requirements from the affected groundwater user
- Proof of claim by a groundwater user, which may include historic groundwater level measurements, bills from power provider, and/or additional records
- Evaluation criteria for determining extent of impact

- Measures that may be taken by the well field operator to mitigate any impact, which may include:
  - Arranging an alternate water supply for the affected party
  - Modifying pumping operations
  - Lowering the pump in an impacted well
  - Deepening or replacing an impacted well
  - Compensating a well operator for significantly increased pumping cost associated with additional lift

Significance Level After Mitigation: Less Than Significant Impact.

Phase II

MF/RO Facilities

The MF/RO facilities at the VWRP would be the same as described for Alternative 1. Impact would be less than significant.

RO Product Water Conveyance System to Ventura County

The RO product water conveyance system facilities are described in Section 6.7.1. The RO product water conveyance system would not include any component that would deplete groundwater supplies or interfere with groundwater recharge. The construction and operation of the RO product water conveyance system would not result in a significant impact. Impact would be less than significant.

Brine Disposal System

The brine disposal system facilities are described in Section 6.7.1. The brine disposal system would rely on a pipeline, DWI, or trucking – each of which was previously analyzed for Alternatives 1, 2, and 3, respectively, but there would be lower peak brine flow to manage so the diameter of the pipeline, number of injection wells, and peak number of truck trips would be smaller. The brine disposal system would not include any component that would deplete groundwater supplies or interfere with groundwater recharge. Impact would be less than significant.

Impact Summary – Phases I and II

The construction of Phase I of Alternative 4 would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. The operation of the East and West Piru well fields could substantially deplete groundwater supplies or interfere substantially with groundwater recharge. Implantation of Mitigation Measures HYDRO-1 and HYDRO-2 would reduce the impact to a less than significant level.

The construction and operation of Phase II of Alternative 4 would not substantially deplete groundwater supplies or interfere substantially with groundwater recharge. The construction and operational impact would be less than significant.

Mitigation Measures: Implement HYDRO-1 and HYDRO-2.

Significance Level After Mitigation: Less Than Significant Impact.