Appendix L Water Demand and Supply Study

Appendices

This page intentionally left blank.

June 2023

Water Supply and Demand Analysis Wine Country Specific Plan

for City of Yucaipa

Prepared for:

City of Yucaipa
Benjamin J. Matlock, Planning Manager/City Planner
34272 Yucaipa Boulevard
Yucaipa, CA 92399
909.797.2489

Project Number:
COY-07.0

Prepared by:

PlaceWorks
Dina El Chammas, P.E. Senior Engineer
3 MacArthur Place, Suite 1100
Santa Ana, CA 92707

Tables **Page**

Figures **Page**

1. Introduction

1.1 INTRODUCTION

This water demand analysis has been prepared for the City of Yucaipa to calculate the water demand that would result from implementation of the Wine Country Specific Plan (WCSP). The analysis assesses the adequacy of water supplies to meet the WCSP's water demand, in addition to the future water demand of the rest of the Yucaipa Valley Water District's (YVWD) service area, including agricultural and manufacturing uses. The analysis documents whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet this projected water demand. Also, water conservation efforts and water shortage contingency plans are described.

References used in preparing this document include the following:

- Yucaipa Valley Water District, June 30, 2021. *2020 Integrated Regional Urban Water Management Plan (IRUWMP), Yucaipa Valley Water District*. Prepared by Upper Santa Ana Water Resources Association.

- Yucaipa Groundwater Sustainability Agency, January 2022, *Final Groundwater Sustainability Plan for the Yucaipa Groundwater Subbasin*. Prepared by Dudek.

1.2 SITE LOCATION AND PROJECT DESCRIPTION

The 1,094-acre Wine Country Specific Plan (WCSP) area is in the northeastern portion of the City of Yucaipa, specifically the North Bench Area of the City as shown in Figure 1, *Regional Vicinity*. The project site is at the foot of the San Bernardino Mountains. The plan area is bounded by Martell Avenue and Norton Avenue on the east, Oak Glen Road on the south, and Fremont Street on the west. The San Bernardino mountains and Carter Street form the irregular northern boundary of the site (see Figure 2, *Site Aerial*).

Current on-site uses consist of limited agricultural enterprises such as farms, grazing, dry farming for winter wheat, an olive grove, and three chicken ranches. There are a few existing homes on the western and northeastern portion. An existing water tank is along Fir Avenue, and a small water storage facility is along Oak Glen Road. The existing uses on the site are not connected to the YVWD water supply system and use onsite water wells. The chicken ranches and agricultural enterprises would be removed under the implementation of the WCSP. The existing homes and the olive orchard would remain and would continue to use their onsite wells.

The WCSP is a proposed phased development, over 20 years, that would subdivide the land into lots (i.e., homes/estates) and nonresidential areas for vineyards, trails, and open space. Under the proposed Specific Plan, land uses would be split approximately 50/50, with residential uses on 547.4 acres and nonresidential uses on 546.2 acres. The residential use acreage would be divided into two groups; residential lots of 10,000 to 14,000 square feet ("Villas") encompassing 315 acres and residential lots of 0.5 acre ("Estates") encompassing 232.4

acres (see Figure 3, *Conceptual Land Use Plan*). The proposed nonresidential land use designations include Agriculture (465.5 acres), Riparian Area (73.6 acres), and Water District (7.1 acres). The Water District designation applies to land owned by YVWD that used for existing infrastructure. The Riparian Area would create a buffer between the proposed residential uses surrounding Wilson Creek and the creek habitat and include multi-purpose trails.

The WCSP would allow a maximum of 1,091 residential units, which is the number of units currently permitted by the existing Rural Living (RL) land use designation for the planning area. The Villas would consist of 629 dwelling units on a minimum lot of 10,000 square feet and the Estates would consist of 462 dwelling units on half-acre lots. The breakdown of the residential units is shown in Table 1.

Table 1 – Proposed Project Land Use

Land Use Designation	Lot Size	Number of Residential Units
Villas	10,000–14,000 Square Feet	629
Estates	Half Acre	462
	Total	**1,091**

The approximately 465.5 acres of land designated for Agriculture would be used for vineyards and wineries — it is anticipated that 345.5 acres would be for vineyards that have no on-site wine production, and 120 acres would be for wineries that include ancillary production/commercial uses that support the vineyards. The WCSP anticipates a total of 26 wineries varying in sizes and onsite accessory buildings. Three different categories of wineries are envisioned: 12 micro-wineries, 10 artisan wineries, and 4 boutique wineries.

- Micro-wineries are small wineries, a minimum of 2.5 acres in size, that could include tasting rooms, wholesale and retail sales, and art and merchandise sales in addition to wine making facilities and vineyards. Micro-wineries would produce approximately 5,000 gallons of wine per year.

- Artisan wineries encompass a minimum of 5 acres and would produce between 2,000 and 50,000 cases of wine per year.[1] In addition to the micro-winery uses listed above, the potential uses would also include bed and breakfast inns, picnic and dining areas, commercial kitchens, marketing events, and small event venues that can accommodate up to 75 guests.

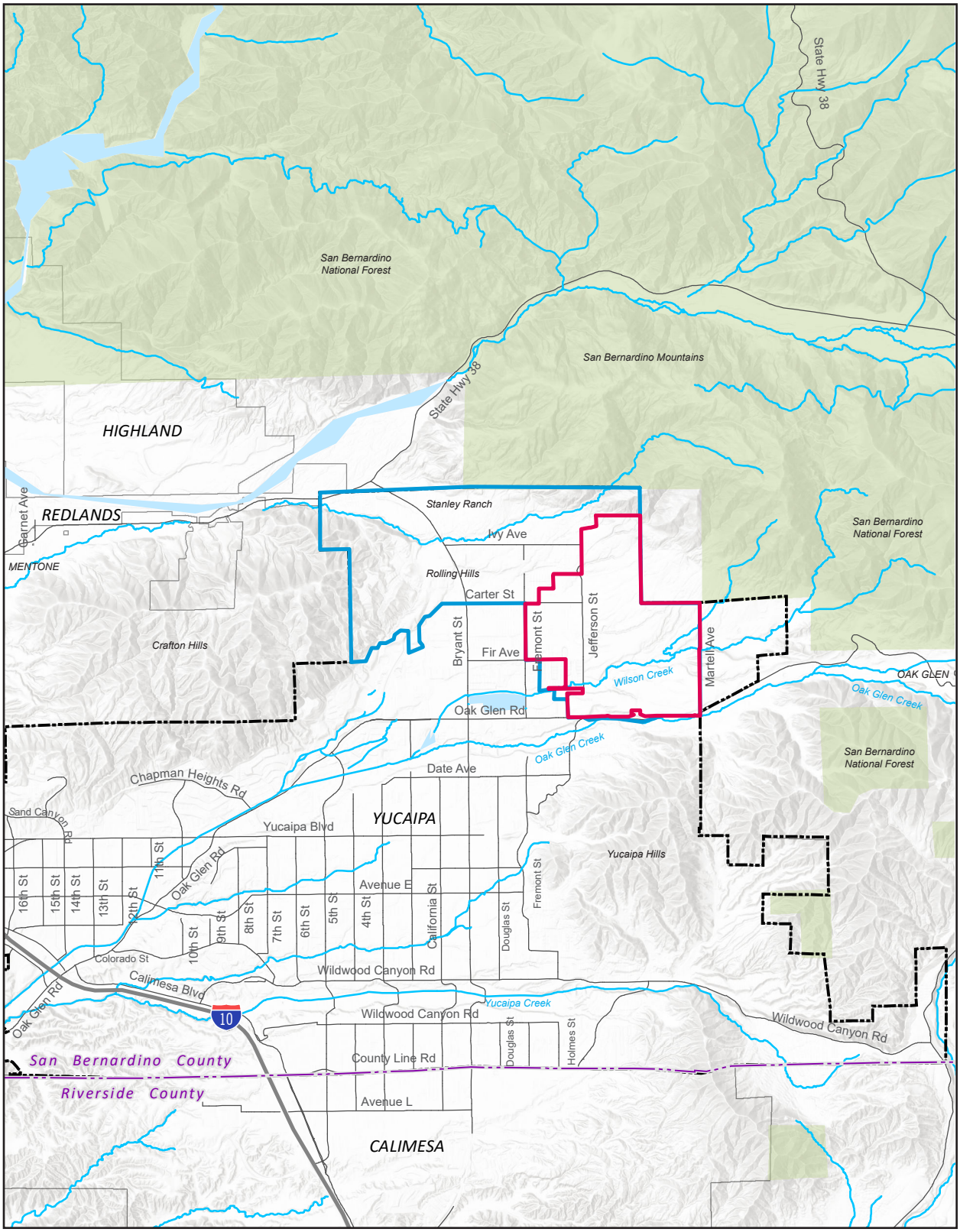
- Boutique wineries would consist of a minimum of 10 acres in size and include all the uses associated with micro- and artisan wineries but could also include distilleries, small bungalow resorts, and special event venues that can accommodate up to 150 guests. Boutique wineries would produce more than 50,000 cases of wine per year.

For each category of winery, the accessory buildings and accessory uses would not occupy more than 25 percent of the gross lot area, with a minimum of 75 percent of the lot used specifically for vineyards.

[1] A case of wine is 2.378 gallons of wine.

Development of the 1,091 homes would proceed over 20 years in five phases: (1) 313 dwelling units, (2) 37 dwelling units, (3) 316 dwelling units, (4) 197 dwelling units, and (5) 228 dwelling units. In each phase, the project would strive for a 50/50 split between vineyards and riparian areas (nonresidential) and residential land uses.

Figure 1 Local Vicinity



Yucaipa City Boundary
North Bench Area
Project Site
San Bernardino National Forest

Note: Unincorporated county areas are shown in white.

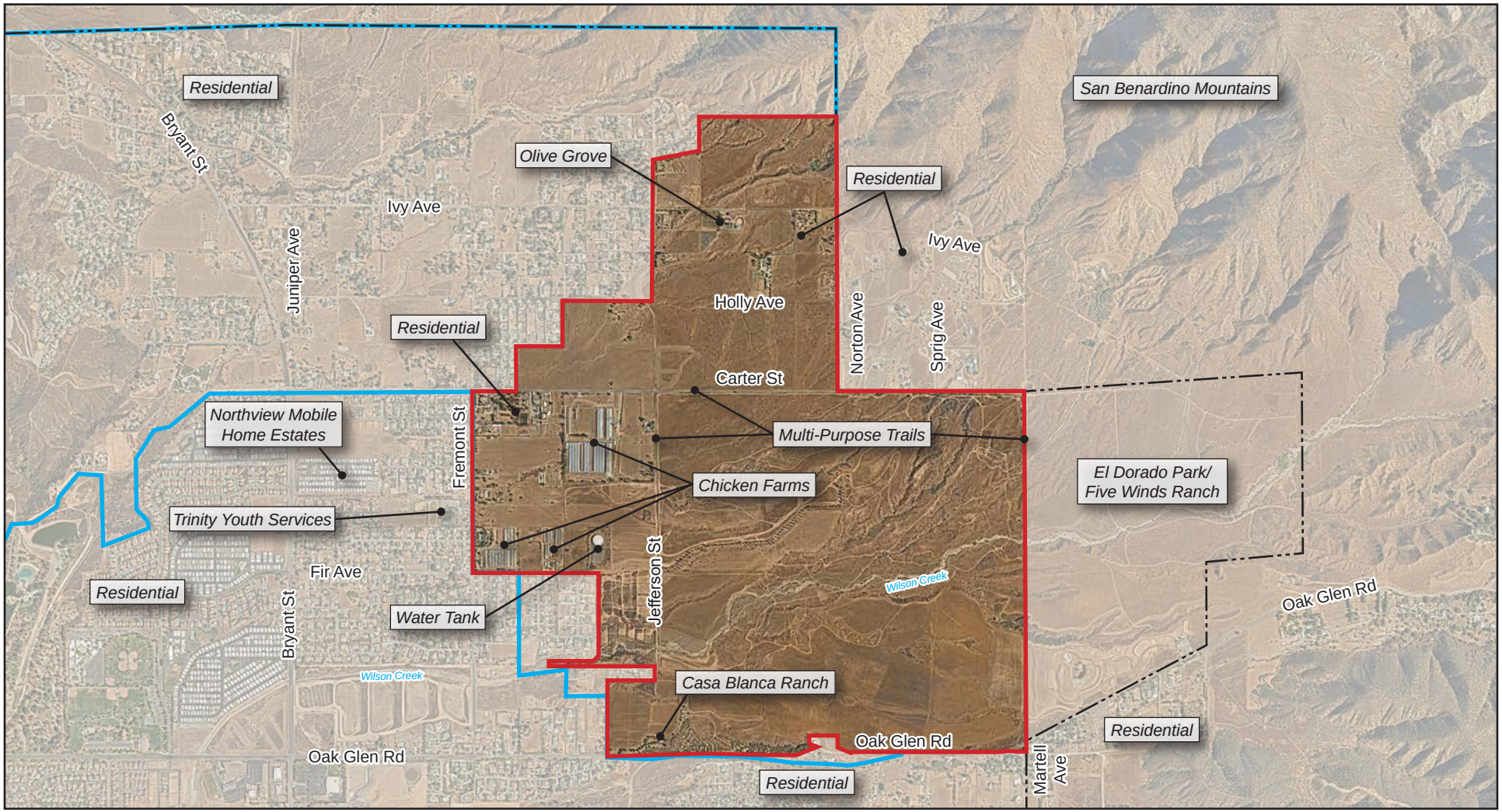
Source: Generated using ArcMap, 2022.

0 1
Scale (Miles)

PlaceWorks

This page intentionally left blank.

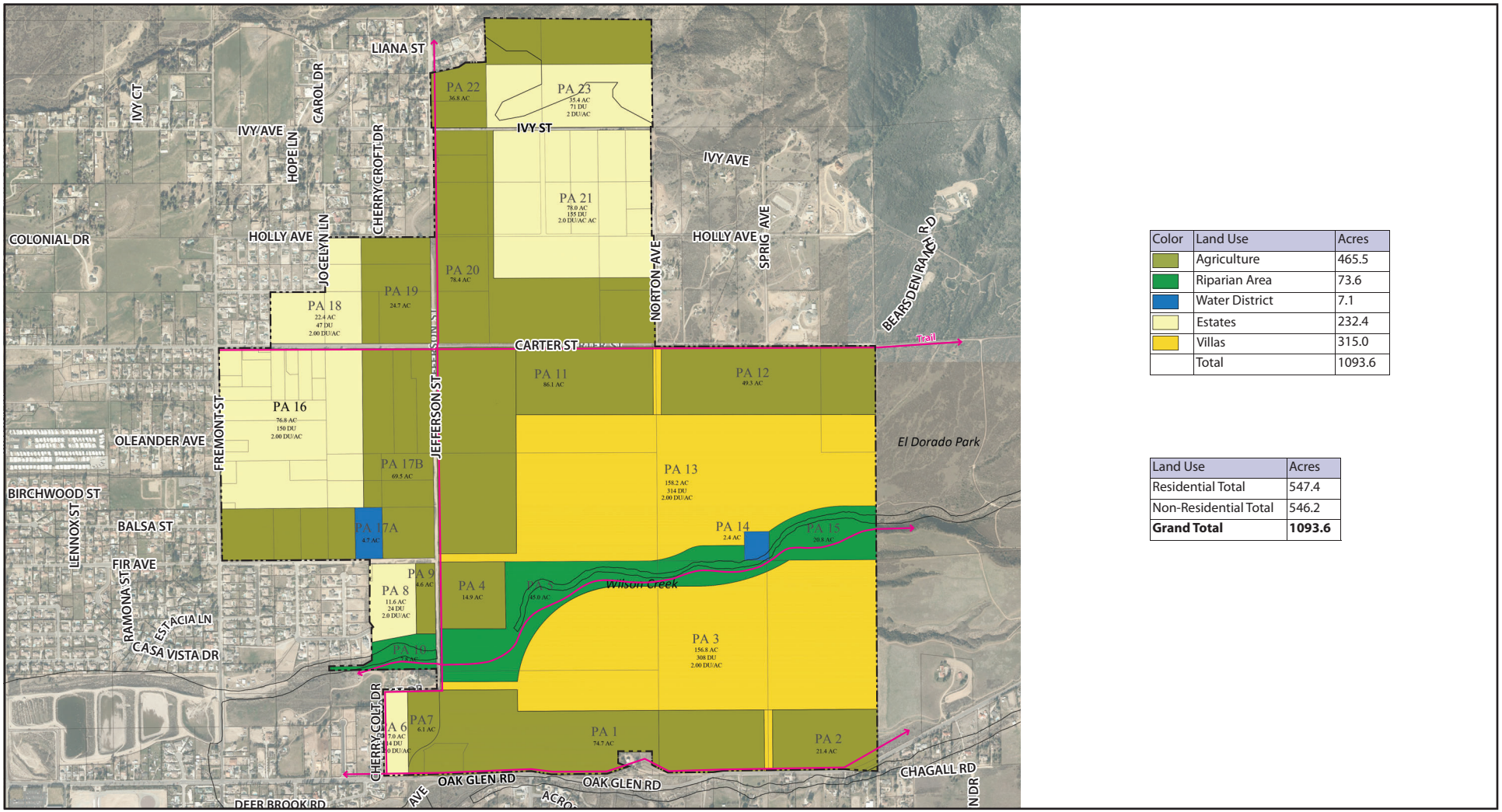
Figure 2 Site Aerial



Source: Nearmap, Inc., 2022.

This page intentionally left blank.

Figure 3 Conceptual Land Use Plan



Color	Land Use	Acres
	Agriculture	465.5
	Riparian Area	73.6
	Water District	7.1
	Estates	232.4
	Villas	315.0
	Total	1093.6

Land Use	Acres
Residential Total	547.4
Non-Residential Total	546.2
Grand Total	**1093.6**

Project Site

Multi-Purpose Trails

0 2,000
Scale (Feet)

Source: City of Yucaipa, 2022; PlaceWorks, 2021.

This page intentionally left blank.

2. Water Supply and Demand Analysis

2.1 WATER PURVEYOR

The Yucaipa Valley Water District (YVWD) service area covers approximately 40 square miles and provides potable water and recycled water to approximately 51,558 people. About 95 percent of the water demand is single family and multi-family residences; the rest of the water demand includes commercial, irrigation, industrial, institutional, construction water and fire service. YVWD uses groundwater, local surface water, imported water, and recycled water to meet customer demands.

YVWD is located in the upper portion of the Santa Ana Watershed approximately 40 miles west of Palm Springs, 70 miles east of Los Angeles, and 120 miles north of San Diego in a high elevation valley at the base of the San Bernardino Mountain Range. YVWD's current service area encompasses approximately 25,742 acres which include the City of Calimesa and the City of Yucaipa. Neighboring cities include the City of Redlands and the City of Beaumont. YVWD's sphere of influence expands the acreage to 43,525 acres.

YVWD serves potable water, wastewater and recycled water to its customers. YVWD serves approximately 14,440 potable water connections through 234 miles of pipeline.There are 14,363 sewer connections and 460 recycled water connections. The sewer collection system extends 222 miles throughout YVWD's service area.

Potable and recycled water demands within the YVWD service area totaled 12,718 acre-feet per year (AFY) for the year 2020. Potable water demand amounted to 11,345 AFY and recycled water demand was 1,374 AFY. The total demands in the year 2045 for a normal year are projected to be 14,746 AFY.

YVWD relies on three primary water resources to meet annual potable water demands; groundwater resources, imported water resources, and local surface water resources. YVWD's potable water supply consists primarily of groundwater pumped from 17 wells located throughout the YVWD service area. In 2020, these wells provided about 62.7 percent of the total potable water supply. Imported water treated at the Yucaipa Valley Regional Water Filtration Facility (YVWRFF) provided 35.8 percent of the potable water supply in 2020. Surface water treated at the Oak Glen Surface Water Treatment Plant provided the remaining 1.5 percent of the potable water supply. In addition to the potable water supplies, YVWD produces recycled water at the Wochholz Regional Water Recycling Facility (WRWRF). Also added to the recycled distribution system is the microfiltration backwash produced at Yucaipa Valley Regional Water Filtration Facility. The combined volume from these two water sources produced enough recycled water to reduce YVWD's potable water demand by 16.5 percent in 2020.

YVWD has traditionally met the bulk of service area customer needs from groundwater using groundwater extraction wells. From 2016 to 2020, YVWD has used groundwater from the Yucaipa Basin, the Beaumont Adjudicated Basin, and the Bunker Hill Subbasin.

The passage of SB X7-7 (also known as the Water Conservation Act of 2009) resulted in increased efforts to reduce potable water usage by requiring all California urban water suppliers to achieve a 20% reduction in demands (from a historical baseline) by 2020. Using a 10-year base period of 2000 to 2009, YVWD's baseline water usage is 286 gallons per capita per day (GPCD). The YVWD's 2020 target is 229 GPCD. The actual 2020 water demand in 2020 was 186 GPCD. Therefore, YVWD met its 2020 water reduction target.

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, single dry, and multiple dry years. As discussed in YVWD's Integrated Regional Urban Water Management Plan (IRUWMP), YVWD is capable of meeting the water demands of its customers in normal, single dry, and multiple dry years between 2020 and 2045.[2]

2.2 WATER DEMAND ANALYSIS

This section includes a discussion of the overall existing and projected demands for the YVWD service area in addition to projected water demands for the WCSP.

2.2.1 Yucaipa Valley Water District Water Demands

The primary source of water for the proposed project would be existing water supplies used by the YVWD to provide service to its customers. This section analyzes the water demands of existing and planned future YVWD customers. Current and projected potable and recycled water demands by customer class are presented in Tables 2 and 3.

Table 2 – Current and Projected Potable Water Demands for the YVWD (AFY)

Use Type	2020	2025	2030	2035	2040	2045
Single Family	8,483	8,018	7,537	7,085	6,660	6,260
Multi-Family	1,141	1,068	1,004	944	887	834
Commercial	285	264	248	233	219	206
Construction Water	35[1]	32	30	28	27	25
Industrial	36	34	32	30	28	26
Institutional/Governmental	332	297	279	262	246	232
Landscape	291	274	258	242	228	214
Sales/Transfers/Exchanges to other agencies	460	2,000	2,000	2,000	2,000	2,000
Losses	281	671	638	606	577	549
Total	**11,345**	**12,658**	**12,026**	**11,430**	**10,872**	**10,346**

Source: YVWD 2020 IRUWMP, 2021.

[1] Also includes water for fire suppression.

AFY = Acre-feet/year

[2] Yucaipa Valley Water District, June 30, 2021. 2020 Integrated Regional Urban Water Management Plan (IRUWMP), Yucaipa Valley Water District. Prepared by Upper Santa Ana Water Resources Association. https://cms9files1.revize.com/yucaipavwd/2020IRUWMP2.pdf.

Table 3 – Current and Projected Recycled Water Demands for YVWD (AFY)

	2020	2025	2030	2035	2040	2045
Recycled Water Demand	1,374	3,630	3,800	4,000	4,200	4,400

Source: YVWD 2020 IRUWMP, 2021.
AFY = Acre-feet/year

YVWD's total 2020 demand was 12,718 AFY. Potable water demand was 11,345 AFY and recycled water demand was 1,374 AFY. The projected 2045 potable water demand is 10,346 AFY and recycled water demand is 4,400 AFY for a total of 14,746 AFY. YVWD has quantified passive savings for its potable water projections. Even as the population continues to grow, YVWD does expect to see an overall decrease in potable water use due to conservation and increased recycled use.

2.2.2 Proposed Project Water Demands

The WCSP would subdivide the plan area into residential lots and nonresidential areas for vineyards, wineries, trails, and open space. The WCSP would allow a maximum of 1,091 residential units with the Villas consisting of 629 dwelling units and the Estates consisting of 462 dwelling units. The proposed nonresidential land use designations include Agriculture (465.5 acres), Riparian Area (73.6 acres), and Water District facilities (7.1 acres), as shown in Figure 3. The Agriculture land use would be allocated for vineyards and wineries.

The proposed development would connect to YVWD's water distribution system, which would be expanded to serve this area. Currently, there is no YVWD service to this area. Recycled water would be used for outdoor irrigation of the residential units, and the vineyards and potable water would be provided for both residential and winery indoor water demands. The existing homes and the existing olive grove would remain with the development of the WCSP and will continue to use their onsite wells.

2.2.2.1 PROPOSED WATER DEMAND FOR RESIDENTIAL USE

An indoor water demand rate of 280 gallon per day per dwelling units (gpd/du) and outdoor water demand rate of 420 gpd/du were used for the proposed 1,091 residential units, as provided by YVWD.[3] As shown in Table 4, the total residential indoor water demand is 342.4 AFY and the total outdoor water demand is 513.6 AFY for a total proposed residential water demand of 856.0 AFY. Recycled water provided by YVWD would be used to meet the outdoor water demand. The outdoor water demand included in Table 4 is conservative since it does not account for the use of rain gardens which is proposed by the WCSP for the residential units.

Table 4 – Proposed Residential Water Demand (AFY)

Number of Units	Indoor Water Demand Rate (gpd/du)	Indoor Water Demand (gpd)	Indoor Water Demand (AFY)	Outdoor Water Demand (gpd/du)	Outdoor Water Demand (gpd)	Outdoor Water Demand (AFY)
1,091	280	305,480	342.4	420	458,220	513.6

Source: Preciado, 2022

[3] Email correspondence with Mia Preciado, Engineering Technician I, YVWD received November 29, 2022.

2.2.2.2 PROPOSED WATER DEMAND FOR PARKS

Public use areas, with a total acreage of 80.7 acres, consist of the property owned by YVWD and the land designated as open space along Wilson Creek (see Figure 3). Allowed uses in these areas include natural channels, levees, spreading grounds, detention basins, roads, trails, culverts, diversion drains, nature preserves, mitigation banks, public utilities and public service uses or structures, wildlife nature preserves, water bodies, and general recreation, leisure, and parks open to the public. It is assumed that five percent of the public use areas (4.0 acres) would consist of parks with irrigated landscaping.[4]

Additionally, the total acreage for the residential portion of the plan area is 547.4 acres. The WCSP allocates any acreage in this area that would not be developed by residential lots to recreation and open space that are accessible to residents. Assuming all the 629 lots allocated to Villas would conservatively be 10,000 square feet, the total acreage for Villas would amount to 144.4 acres. The total acreage for the Estate lots would be 231.0 acres. This results in up to 172.0 acres that could be allocated to recreation and open space. It is assumed that five percent of this area, 8.6 acres, could consist of irrigated landscaping.[4]

Per the YVWD's design criteria for recycled water distribution systems, a recycled water demand rate of 2,800 gpd/acre for schools and parks was used to calculate the proposed recycled water demand for the proposed parks.[5] As shown in Table 5, the total recycled water demand is 39.5 AFY.

Table 5 – Proposed Park Water Demand (AFY)

Park Use	Acreage (acres)	Recycled Water Demand Rate (gpd/acres)	Outdoor Water Demand (gpd)	Outdoor Water Demand (AFY)
Open to the Public	4.0	2,800	11,200	12.5
Open to Residents	8.6	2,800	24,080	27.0
Total	**12.6**	**-**	**35,280**	**39.5**

Source: YVWD 2022

2.2.2.3 PROPOSED WATER DEMAND FOR VINEYARDS

The WCSP designates a total of 465.5 acres for vineyards and wineries. It is anticipated that 345.5 acres would be for vineyards that have no on-site wine production, and 120 acres would be for wineries that have vineyards. The wineries would not occupy more than 25 percent of the gross lot area, with 75 percent of the property allocated for vineyards. Therefore, it is assumed that the area designated for wineries would include 90 acres of vineyards for a total of 435.5 acres of vineyards within the plan area.

[4] This assumption is based on the Casa Blanca Tentative Tract Map (TTM) that complies with the WCSP and lays out a typical new development in the planning area with associated landscaping. A small public park, amounting to 5 percent of the public use area, is shown on the TTM.
[5] Yucaipa Valley Water District, November 3, 2022 (received from Mia Preciado), Design Criteria for Recycled Water Distribution Systems.

The water demand for the vineyards was calculated, using information provided by Cesar Roland, Vines of the Valley,[6] and vineyard water demand calculations provided by eVineyard.[7]

The recycled water use for vineyards was based on a spacing between rows of 6 feet and a spacing of 8 feet between trellises for a total area per vine of 48 SF.[8] The shaded area per vine was calculated by assuming that the average width of shade provided by the grape canopy is 3 feet. The shaded area per vine was then calculated by multiplying the spacing between the trellises by the average width of shaded area provided by each vine for a total of 24 SF. The percent shaded area (PSA) was calculated by dividing the shaded area per vine by the total area per vine for a PSA of 50 percent. The crop coefficient (Kc) for grapevines was then calculated as follows:[9]

$$Kc = PSA\ x\ 0.017 = 50\ x\ 0.017 = 0.85$$

A reference evapotranspiration (ETo) of 57.45 inches/year, or 0.157 inches per day, was used per the IRUWMP.[10] The daily ETo rate of 0.157 inches per day was adjusted for grapevines by multiplying by Kc for a crop evapotranspiration Etc of 0.134 inches/day.

To determine the annual water demand per acre, an acre-inch conversion factor of 27,500 gallons per acre-inch and a growing season of 150 days were used in the following equation:[11,12]

$$\begin{aligned} &Estimated\ Water\ Use\ (gallons/acre \bullet year) \\ &\quad = ETc\ (inch/day)\ x\ 27{,}500\ (gallons/acre \bullet inch)\ x\ 150\ (days/year) \\ &\quad = 0.134\ x\ 27{,}500\ x\ 150\ = 551{,}874\ gallons/acre \bullet year \end{aligned}$$

Therefore, the total annual water demand for 435.5 acres is 240,341,190 gallons/year. It is assumed that all vineyards would be irrigated with a drip irrigation system. An irrigation system efficiency of 0.90 was assumed for an estimated water demand of 267,045,766 gallons/year or 820.8 AFY. This water demand is conservative since it does not account for sustainable agriculture practices that would be implemented at the vineyards per the WCSP.

2.2.2.4 PROPOSED WATER DEMAND FOR WINERIES

The wineries would require potable water provided by YVWD for processing the grapes into wine and also water for employees, tasting room guests, restaurant guests, guests at special events, and overnight guests.

[6] Email correspondence with Cesar Roland, Vines of the Valley, received August 7, 2022.
[7] eVineyard, 2022. Vineyard management software, accessed at https://www.evineyardapp.com/blog/2018/04/09/how-to-schedule-vineyard-irrigation/ on December 10, 2022.
[8] Email correspondence with Cesar Roland, Vines of the Valley, received August 7, 2022.
[9] Texas A&M Agrilife Extension, 2015. Irrigation Scheduling of Grapevines with Evapotranspiration Data. http://agrilife.org/winegrapes/files/2015/11/irrigationscheduling.pdf.
[10] Yucaipa Valley Water District, June 30, 2021. 2020 Integrated Regional Urban Water Management Plan (IRUWMP), Yucaipa Valley Water District. Prepared by Upper Santa Ana Water Resources Association. https://cms9files1.revize.com/yucaipavwd/2020IRUWMP2.pdf.
[11] Texas A&M Agrilife Extension, 2015. Irrigation Scheduling of Grapevines with Evapotranspiration Data. http://agrilife.org/winegrapes/files/2015/11/irrigationscheduling.pdf.
[12] Email correspondence with Cesar Roland, Vines of the Valley, received August 7, 2022. Cesar noted that in the last 4 years the growing season extended, on average, from April to late August.

All three types of wineries would potentially have tasting rooms. Additionally, restaurants and bed and breakfast inns are allowed for Artisan and Boutique wineries. The Boutique wineries could also have small bungalow resorts. Artisan wineries are allowed to host small event venues with up to 75 guests, while Boutique wineries are allowed to host special events with up to 150 guests.

Wineries also require process water to make wine. Process water is primarily used for washing and sanitizing equipment. Although it is possible to treat the process water on site and reuse it for irrigation of the vineyards, it is conservatively assumed for this analysis that none of the wineries would reclaim their process water. However, this is an option that may be pursued on a case-by-case basis.

Table 6 lists the water demand rates for the various water demand rates for the wineries the sources for these assumptions.

Table 6 – Proposed Water Demand Rates for the Wineries

Specific Use	Water Demand Rate	Source
Process Water	4 gallons of water per gallon of wine	Henry Cornell Winery, EIR, August 2012.
Winery Employee	15 gpd/employee	Henry Cornell Winery, EIR, August 2012
Tasting Rooms	2.5 gpd/guest	Henry Cornell Winery, EIR, August 2012
Restaurants	25 gpd/guest	Henry Cornell Winery, EIR, August 2012
Special Event Venues	25 gallons/guest/event	Henry Cornell Winery, EIR, August 2012
Bed and Breakfast Inns and Small Bungalow Resorts	60 gallons/room/day	Pacific Institute, 2007. Hidden Oasis: Water Conservation and Efficiency in Las Vegas, Appendix E. Calculation of Potential Water Savings at Resorts and Casinos. 2022 CalGreen Code for water fixture requirements.

Appendix A includes information provided by YVWD based on meter data from actual facilities within their service area. The meter data from each facility, which is a total amount of water used per month, was used to calculate an average daily water use in gpd. As shown in Appendix A, the rates in Table 6 are conservative when compared to actual water demand within YVWD's service area.

Table 7 provides the proposed water demand for the wineries. The assumptions and detailed calculations shown in Table 7 include the following assumptions:

- The twelve Micro-wineries would each produce approximately 5,000 gallons of wine per year for a total of 60,000 gallons per year. The ten Artisan wineries are conservatory assumed to produce 50,000 cases each, or 118,900 gallons, of wine per year for a total of 1,189,000 gallons per year. The four Boutique wineries are assumed to produce 75,000 cases each, or 178,350 gallons, of wine per year, for a total of 713,400 gallons per year. Therefore, the 26 wineries will produce approximately 1,962,400 gallons per year.

- The economic impact study for the WCSP assumed that the vineyards would require 0.0926 employees per acre and the wineries would require nine employees per winery.[13] The 435.5 acres of the plan area allocated to agriculture use will therefore generate 40 fieldworkers and the 26 wineries would generate 234 employees.

[13] PlaceWorks, August 6, 2021. Economic Impact Study, Phase 2 Viticulture and Associated Development Standards.

- It is assumed that the tasting rooms and restaurants would be operational 7 days a week, minus holidays, for a total of 350 days per year. The Bed and Breakfast inns and small resort bungalows were also assumed to be open 350 days per year.

- The trip generation estimates for the WCSP assumed 30 guests per winery per weekday and 50 guests per winery on weekends.[14] Visitors were averaged over 5 weekdays and 2 weekends for an average of 36 visitors/day per winery.

- It was assumed that a typical tasting room guest visits three to four wineries per trip; therefore, the water demand calculations assumed each tasting room guest visits 3.5 tasting rooms for a total of 125 tasting room guests per day.[15] It was assumed that half of the tasting room guests would dine at one of the winery restaurants for a total of 63 dinner guests/day.

- The trip generation estimates for the WCSP assumed 10 special events per year. Guests for special events were averaged over the ten Artisan wineries that can accommodate up to 75 guests, and the four Boutique wineries that can accommodate up to 150 guests. The average number of guests at special events amounted to 96 guests per event.

- It assumed that the occupancy rate for overnight visitors is 60 percent. Additionally, per a conversation with the City of Yucaipa planning department, it is assumed that:

    - Two Artisan wineries and one Boutique winery would have Bed and Breakfast inns with 6 rooms per inn for a total of 18 rooms.

    - Two Boutique wineries would have a small bungalow resort with 45 rooms per resort for a total of 90 rooms.[16]

Table 7 – Proposed Wineries Water Demand (AFY)

Specific Use	Water Demand Rate	Unit	Number of days per year	Total Water Demand (gallons/year)	Total Water Demand (AFY)
Process Water	4 gallons of water per gallon of wine	1,962,400 gallons of wine per year	-	7,849,600	24.09
Winery Employees	15 gpd/employee	274 employees	350 days/year	1,440,218	4.42
Tasting Rooms	2.5 gpd/guest	125 guests	350 days/year	109,375	0.34
Restaurants	25 gpd/guest	63 guests	350 days/year	546,875	1.68
Event Venues	25 gallons/guest/event	96 guests	10 events/year	24,107	0.07
Bed and Breakfast Inns and Small Bungalow Resorts	60 gallons/room/day	65 rooms	350 days/year	1,360,800	4.18
Total	**-**	**-**	**-**	**11,345,007**	**34.8**

[14] IBI, June 7, 2023. Wine Country Specific Plan VMT Analysis.
[15] The actual average number of guests per day is 35.71 rounded to 36.
[16] Email correspondence with Benjamin Matlock, Planning Manager/City Planner, City of Yucaipa, received October 13, 2022.

2.2.2.5 TOTAL PROPOSED WATER DEMAND

The total proposed water demand for potable versus recycled water for the residential uses, public landscaped areas, vineyards, and wineries are shown in Table 8. As shown in Table 8, the total proposed potable water demand is 377.2 AFY and the total proposed recycled water demand is 1,373.9 AFY.

Table 8 – Proposed Total Water Demand

Land Use	Total Water Usage (AFY)
Potable Water Demand	
Residential	342.4
Wineries	34.8
Total	**377.2**
Recycled Water Demand	
Residential	513.6
Public Landscaped Areas	39.5
Vineyards	820.8
Total	**1,373.9**

2.3 WATER SUPPLY RELIABILITY

It is required that every urban water supplier assess the reliability to provide water service to its customers under normal, dry, and multiple dry water years. YVWD depends on a combination of imported and local supplies to meet its water demands and has taken numerous steps to ensure that it has adequate supplies. Water supplies available to YVWD are projected to meet full-service demands. The IRUWMP states that the YVWD will be able to meet demand with projected supplies between 2020 and 2045 during normal years, single dry years, and multiple dry years (see Table 9).[17]

Table 9 – Normal, Single Dry, and Multiple Dry Year Supply and Demand (AFY)

		2025	2030	2035	2040	2045
Normal Year						
Supply Totals		59,180	65,400	72,700	78,950	85,300
Demand Totals		16,288	15,826	15,430	15,072	14,746
Difference		**42,892**	**49,574**	**57,720**	**63,879**	**70,554**
Single Dry Year						
Supply Totals		59,180	65,400	72,700	78,900	85,300
Demand Totals		12,658	12,026	11,430	10,872	10,346
Difference		**46,522**	**53,374**	**61,270**	**68,028**	**74,954**
Multiple Dry Year						
First Year	Supply Totals	59,180	65,400	72,700	78,950	85,300

[17] Yucaipa Valley Water District, June 30, 2021. 2020 Integrated Regional Urban Water Management Plan (IRUWMP), Yucaipa Valley Water District. Prepared by Upper Santa Ana Water Resources Association. https://cms9files1.revize.com/yucaipavwd/2020IRUWMP2.pdf.

Table 9 – Normal, Single Dry, and Multiple Dry Year Supply and Demand (AFY)

		2025	2030	2035	2040	2045
	Demand Totals	12,658	12,026	11,430	10,872	10,346
	Difference	**46,522**	**53,374**	**61,270**	**68,078**	**74,954**
Second Year	Supply Totals	55,261	61,000	67,000	68,000	69,000
	Demand Totals	11,696	11,256	10,744	10,470	9,994
	Difference	**43,565**	**49,744**	**56,256**	**57,530**	**59,006**
Third Year	Supply Totals	55,888	58,000	64,000	65,000	66,000
	Demand Totals	10,087	10,536	10,100	10,082	9,654
	Difference	**45,081**	**47,464**	**53,900**	**54,918**	**56,346**
Fourth Year	Supply Totals	56,861	55,000	61,000	62,000	63,000
	Demand Totals	9,986	9,862	9,494	9,709	9,326
	Difference	**46,875**	**45,138**	**51,506**	**52,291**	**53,674**
Fifth Year	Supply Totals	55,104	52,000	58,000	59,000	60,000
	Demand Totals	9,227	9,230	8,924	9,350	9,009
	Difference	**45,877**	**42,770**	**49,076**	**49,650**	**50,991**

Source: YVWD 2020 IRUWMP, 2021.

Because of its continued recharge efforts and the increasing use of recycled water, YVWD anticipates success in meeting the needs of its population in the future even as the population continues to grow, and the likelihood of severe droughts persist. Future homes in the YVWD service area will be constructed with drinking water for interior use and recycled water for exterior use. YVWD is also reviewing concept documents related to participation in the Bunker Hill Conjunctive Use Project. This program would provide a water banking opportunity in the Bunker Hill Subbasin during wet periods for extraction when imported supplies from the SWP are limited. Additionally, YVWD is completing the necessary studies to implement the Calimesa Aquifer Storage and Recovery Project. This project will be a system of injection wells that will inject recycled water into the aquifer. That water can be pulled from those same injections wells to be used as recycled water or drawn from wells farther away as potable water. This project would allow YVWD a great amount of flexibility to meet both the recycled and potable needs of the community.[18]

2.4 SUPPLY AND DEMAND ANALYSIS

The proposed water demand for development pursuant to the WCSP is provided in Sections 2.2.2. However, to evaluate water supply vs. demand within the YVWD's service area, the proposed water demand for the proposed development should be included with the water demand for current and anticipated future development within YVWD's service boundaries.

The 2016 Yucaipa General Plan designates the plan area as Rural Living (RL). Single-family residential is the primary use, coexisting with open space and agriculture/agrarian uses. The maximum development gross density is one unit per acre. The WCSP maintains the land use requirement and buildout capacity of the General

[18] Yucaipa Valley Water District, June 30, 2021. 2020 Integrated Regional Urban Water Management Plan (IRUWMP), Yucaipa Valley Water District. Prepared by Upper Santa Ana Water Resources Association. https://cms9files1.revize.com/yucaipavwd/2020IRUWMP2.pdf.

Plan, with the same total number of dwelling units on the entire site. However, the WCSP would allow residential units at a higher net density, up to four units per acre, while maintaining the effective gross one-acre density over the entire plan area and then balancing the remainder to create areas that specifically support viticultural.

The 2020 IRUWMP for the YVWD service area relies on population projections established by the California Department of Finance (DOF). These projections were used to establish future water demands.[19] Water use projections also considered codes, ordinances, and land use plans to refine the water demand estimates.[20] The DOF relies on general plan buildout projections, among other factors, to establish future population estimates. Therefore, the population projections DOF allocated to the plan area relate to 1,091 dwelling units per the 2016 Yucaipa General Plan. The water demand for these dwelling units is therefore accounted for in the water demand projections in the 2020 IRUWMP.

YVWD uses a potable water demand factor of 300 gpd and a recycled water demand factor of 700 gpd for single family units with lots greater than 20,000 square feet, which is consistent with the Rural Living (RL) land use designation.[21] Therefore, the water demands accounted for in the 2020 IRUWMP for the planning area are assumed to be 367 AFY for potable water use and 856 AFY for recycled water use. The IRUWMP accounts for an approximately additional 25 AFY for potable water and 342 AFY for recycled water when compared to the residential uses proposed by the WCSP.

Additionally, the 2020 IRWUMP accounts for a population growth of 12,821 from 2020 to 2045. Assuming the DOF rate of 2.76 persons per household, the proposed development pursuant to the WCSP would increase the population by 3,000.[22] This population growth is within the population projection in the 2020 IRUWMP.

The wineries and vineyards are proposed new uses in the plan area and would not have been accounted for in the 2020 IRUWMP water demand projections. It is assumed that the recycled water demand for the parks is also not accounted for. The total water demand for the wineries is 34.8 AFY and the total recycled water demand for the vineyards and parks is 860.3 AFY (see Table 8). Therefore, the total unaccounted water demand is 895.1 AFY. According to YVWD, and as shown in Table 9, YVWD has a water surplus ranging from a minimum of 50,991 AFY to a maximum of 74,954 AFY in the year 2045 (at project buildout). Therefore, YVWD would have enough water supply to accommodate the proposed development pursuant to the WCSP. Additionally, YVWD anticipates that its recycled water demand would increase from 1,374 AFY in 2020 to 4,400 AFY in 2045 and the WCSP recycled water demand of 895.1 AFY is within this projection. Therefore, implementation of the proposed project will not obstruct the YVWD's ability to meet water demands of its customers in normal, single dry, and multiple dry years.

[19] Phone conversation with YVWD, November 15, 2022.
[20] Yucaipa Valley Water District, June 30, 2021. 2020 Integrated Regional Urban Water Management Plan (IRUWMP), Yucaipa Valley Water District. Prepared by Upper Santa Ana Water Resources Association. https://cms9files1.revize.com/yucaipavwd/2020IRUWMP2.pdf.
[21] Yucaipa Valley Water District, 2022 (received from YVWD). Design Criteria for Potable Water Distribution Systems.
[22] California Department of Finance. 2022. E-5 Population and Housing Estimates for Cities, Counties, and the State, 2020 – 2022. https://dof.ca.gov/forecasting/demographics/estimates/e-5-population-and-housing-estimates-for-cities-counties-and-the-state-2020-2022/.

2.5 WATER SHORTAGE CONTINGENCY PLANNING

YVWD adopted a revised Water Shortage Contingency Plan (WSCP) and Water Waste Ordinance in 2019. The goal of Ordinance 60-2019, *New Water Conservation Rules and Regulations to Reduce Water Shortage and Water Waste*, is to conserve groundwater and surface waters, establish clear water conservation measures for customers, align with recently passed State legislation, and support the concepts presented in Making Water Conservation a California Way of Life. YVWD uses six shortage stages to identify and respond to water shortage emergencies as shown in Table 10.

Table 10 – Water Shortage Contingency Plan Levels

Shortage Level	Percent Shortage Range	Shortage Response Actions
1	Up to 10%	No conservation triggers or water savings objectives are initiated at this level.
2	Up to 20%	Public is notified of shortage. Customers are reminded to conserve water. YVWD asses main flushing and reservoir cleaning activities.
3	Up to 30%	Continued voluntary cooperation. YVWD consults with customer groups, initiates major public media campaign, identifies next steps, regulates construction meter activity, contacts largest customers, and prepares for level 4.
4	Up to 40%	YVWD prohibits watering during the day, ornamental fountains, and car washing, limits watering to certain days etc.
5	Up to 50%	YVWD implements rate surcharge, continues water patrols, curtails fire flow and pipeline testing, prohibits turf irrigation, and rescinds construction meters.
6	>50%	YVWD conducts monthly community meetings and enforces fines and penalties.

Source: YVWD 2020 IRUWMP, 2021.

At a minimum, YVWD encourages baseline conservation efforts year-round, regardless of a shortage emergency.

2.6 DEMAND MANAGEMENT MEASURES

Demand Management Measures are mechanisms implemented by YVWD to increase water conservation. The YVWD was a signatory to the California Urban Water Conservation Council's Memorandum of Understanding which was developed to expedite implementation of reasonable water conservation measures in urban areas and to establish assumptions for use in calculating estimates of reliable future water conservation savings. YVWD is now a member of the California Water Efficiency Partnership which replaced the California Urban Water Conservation Council. The following demand management measures were implemented by YVWD over the last five years:

- **Metering:** YVWD customers are all metered. In addition, YVWD is actively replacing aged meters with AMI Sensus meters. The AMI meters enable YVWD and its customers to track water use, waste, and leaks on a timely basis.

- **Retail Conservation Pricing:** The Retail Water Service Rate best management practice was developed to establish a strong nexus between volume related system costs and volumetric commodity rates, allowing conservation pricing to reward water efficient customers. YVWD practices conservation pricing for its water service with a commodity rate structure that includes five tiers.

- **Public Education and Outreach:** YVWD engages in education and outreach for the community and school groups throughout the year. YVWD offers facility tours and in class presentations for the community and schools. Facility tours emphasize where Yucaipa and Calimesa's water originates and treatment processes and conservation techniques as well. YVWD also participates in regional events coordinated by the retailers in the San Bernardino Valley.

- **Distribution System Real Loss Programs:** YVWD completes its standard water audit and balance using the American Water Works Association Water Loss software to determine the current volume of apparent and real water loss and the cost impact of these losses on utility operations.

- **Water Conservation Program Coordination:** YVWD is a member of the Basin Technical Advisory Commission, Water Conservation Subcommittee. The committee meets bi-monthly to coordinate water conservation programs and events throughout the San Bernardino Valley Municipal Water District's service area.[23]

2.7 SUMMARY

A Water Supply and Demand Analysis was prepared to assess the water demand and supply conditions associated with development pursuant to the WCSP. As shown in Table 8, the total potable water demand is estimated to be 377.2 AFY. The total recycled water demand is estimated to be 1,373.9 AFY. Therefore, the total water demand would be 1,751.1 AFY. This water demand is conservative since it does not account for the use of rain gardens, sustainable agricultural practices, and the possible recycling of process water at the wineries.

According to the 2020 IRUWMP, YVWD has adequate supplies to serve 100 percent of its customers during normal, dry year, and multiple dry year demand through 2045 accounting for projected population increases and corresponding increases in water demand. The 2020 IRUWMP for the YVWD service area accounts for additional indoor and outdoor water demand associated with the 1,091 dwelling units than the water demand anticipated for the residential portion of the WCSP. Additionally, the 2020 IRWUMP accounts for a population growth of 12,821 from 2020 to 2045. The WCSP would increase the population by 3,000, which is within the population projection in the 2020 IRUWMP.

[23] Yucaipa Valley Water District, June 30, 2021. 2020 Integrated Regional Urban Water Management Plan (IRUWMP), Yucaipa Valley Water District. Prepared by Upper Santa Ana Water Resources Association. https://cms9files1.revize.com/yucaipavwd/2020IRUWMP2.pdf.

The wineries and vineyards were not accounted for in the 2020 IRUWMP water demand projections. It is assumed that the recycled water demand for the public landscaped areas is also not accounted for. The total potable water demand for the wineries is 34.8 AFY and the total recycled water demand for the vineyards and public landscaped areas is 860.3 AFY. Therefore, the total unaccounted water demand is 895.1 AFY. YVWD has a water surplus ranging from a minimum of 50,991 AFY to a maximum of 74,954 AFY in the year 2045 (at project buildout). Therefore, YVWD would have enough water supply to accommodate the proposed development pursuant to the WCSP. Additionally, YVWD anticipates that its recycled water demand would increase from 1,374 AFY in 2020 to 4,400 AFY in 2045 and the WCSP recycled water demand of 896 AFY is within this projection.

This analysis concludes that YVWD will have sufficient water supplies available during normal, single dry, and multiple dry years through the year 2045 to meet all projected water demands associated with its existing and future customers, including the proposed project. In the unlikely event of a water shortage, implementation of YVWD's Water Shortage Contingency Plan and demand management measures would ensure that sufficient water supplies were available to serve its customers, including the project and existing and future users.

Appendix A Comparison of Actual Water Use to Proposed Water Demand Rates

The table below includes information provided by YVWD based on meter data from facilities within their service area as a comparison to the water demand factors used in this analysis. The meter data from each facility, which is a total amount of water used per month, was used to calculate an average daily water use in gpd.

The local brewery, Brewcaipa, includes no in-house food service, a large production facility, and a large taproom. The average water demand is compared to the water demand for a proposed mid-size Artisan Winery with no restaurant. Two local restaurants, Jakes Italian Bistro and Kluddes, were included in the data as representative of a small local restaurant. The actual water use was compared to the proposed water use for restaurants at the wineries. The large local restaurant (Hickory Ranch Steakhouse) includes a bar, food service, and large events. This use was compared to the water demand at an Artisan or Boutique winery that hosts large events and includes a restaurant. The motel rates were based on meter data from Sunset Motel and Yucaipa Valley Inn both. Based on images on Google maps, the motels have approximately 12 rooms each. This water demand is compared to the proposed water demand for bed and breakfast inns and small bungalow resorts.

Comparison of Actual Water Use to Proposed Water Demand Rates

Land Use Designation	Actual Water Use (gpd)	Proposed Land Use Designation	Proposed Water Demand (gpd)
Local Brewery	621	Artisan Winery	
		Process Water[1]	407
		Tasting Room[2]	75
		Employees[3]	160
		Total	**642**
Local Restaurant (small)	898	Winery Restaurant[4]	1,000
Local Restaurant (large)	1,500	Tasting Room	75
		Winery Restaurant/Special Events[5]	1,500
		Total	**1,575**
Local Motel	137	Breakfast Inns and Small Bungalow Resorts[7]	**420**

[1] Brewcaipa is assumed to be comparable to an Artisan Winery that produces about 15,000 cases of wine per year (or 35,670 gallons per year). The rate of 4 gallons of process water to four gallons of wine is used.

[2] Assuming an average of 30 guests per day at 2.5 gallons/guest.

[3] Wineries would have 9 employees and 2 fieldworkers on average. The water demand is 15 gallons per employee.

[4] Assuming an average of 40 guests per day at 25 gallons/guest.

[5] Assuming an average of 60 guests per day at 25 gallons/guest. This accounts for guests dinning at the restaurant and guests attending special events of up to 60 guests.

[7] Assumed to have 12 rooms, with approximately 7 rooms occupied, at 60 gallons per room.

Source: Preciado, 2022

As shown in the table, the proposed water demand rates used in this analysis for the WCSP are conservative and slightly higher as compared to existing facilities in Yucaipa with similar land uses.