

City of Brentwood: Priority Area 1 Specific Plan Water Supply Assessment

Prepared for

City of Brentwood

February 2018

WEST YOST

ASSOCIATES
Consulting Engineers

487-12-16-12

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City of Brentwood

Project No. 487-12-16-12



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City of Brentwood: Priority Area 1 Specific Plan

Water Supply Assessment

EXECUTIVE SUMMARY

Purpose of Water Supply Assessment

The purpose of this Water Supply Assessment (WSA) is to perform the evaluation required by California Water Code sections 10910 through 10915, as established by Senate Bill 610 (SB 610), in connection with the City of Brentwood's (City) proposed Priority Area 1 Specific Plan (Proposed Project), and to support the Environmental Impact Report (EIR) being prepared for the Proposed Project. This WSA evaluates the adequacy of the City's total projected water supplies, including existing water supplies and future planned water supplies, to meet the City's existing and projected future water demands, including those future water demands associated with the Proposed Project, under all hydrologic conditions (Normal Years, Single Dry Years, and Multiple Dry Years).

Proposed Project Overview

The Proposed Project will be a mixed-use development that will include medium and high density residential units, a transit station and associated residential and non-residential land uses, a fire station, and commercial and light industrial land uses. The Proposed Project area includes approximately 373 acres of land located in the northwest corner of the City, south of Lone Tree Way, west of Shady Willow Lane, north of Old Sand Creek Road, and east of Heidorn Ranch Road. Approximately 83 acres (Brentwood Station and Lone Tree Plaza) are currently fully developed and not analyzed in this WSA. The water demand and supply for the remaining 290 acres are discussed below. State Route 4 traverses the Proposed Project area from north to south and bisects the area nearly in half. A segment of Sand Creek is located in the southeast corner of the Proposed Project area.

The Proposed Project meets the definition of a "Project" per California Water Code sections 10910 through 10915, as established by SB 610 in 2001, thus requiring the preparation of this WSA.

Potable and Recycled Water Demands and Supply Availability

Projected water demands for buildout of the Proposed Project total approximately 1,283 acre-feet per year (af/yr), of which about approximately 1,164 af/yr is potable water demand and approximately 119 af/yr is recycled water demand for landscape irrigation. These demands were included in the City's 2015 UWMP as part of the general projections for future population and water demand growth. Because recycled water infrastructure may not be initially available to deliver recycled water to the Proposed Project, potable water supplies, if available, may be used to meet the non-potable water demands associated with the initial phases of the Proposed Project.

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It is anticipated that the Proposed Project, if approved by the City, would be served from the City's existing and future portfolio of water supplies. The City currently receives water supplies from five sources:

- Surface water from the Delta purchased from East Contra Costa Irrigation District (ECCID). This water is delivered to the City by three separate sources:
 - Surface water treated at the Randall-Bold Water Treatment Plant, which receives water from the Contra Costa Canal.
 - Surface water treated at the City of Brentwood Water Treatment Plant, which receives water from the Contra Costa Canal.
 - Raw water used for non-potable uses, delivered via the ECCID Canal.
- Groundwater pumped from groundwater wells located within the City.
- Recycled water treated at the City of Brentwood Wastewater Treatment Plant (WWTP). This water may only be used for non-potable uses.

The City has always met system water demand, regardless of regional hydrology. The City expects no reductions from normal-year supply during single or multiple dry years. In the event of a water shortage, the City would implement demand reduction measures as outlined in its Water Shortage Contingency Plan, which would apply to all customers completely, including the Proposed Project. Table ES-1 compares the projected available water supplies and water demands (including the Proposed Project) through 2040. As shown in Table ES-1, available water supplies are more than sufficient to meet the projected water demands for the next 20 years.

Pursuant to Water Code section 10910(c)(4), and based on the technical analyses described in this Water Supply Assessment, this Water Supply Assessment demonstrates that the City's existing and additional planned future water supplies are sufficient to meet the City's existing and projected future water demands, including those future water demands associated with the Proposed Project, to the year 2040 under all hydrologic conditions (including Normal Years, Single Dry Years, and Multiple Dry Years).

City of Brentwood: Priority Area 1 Specific Plan

Water Supply Assessment

Table ES-1. Summary of Water Demand Versus Supply During Hydrologic Normal, Single Dry, and Multiple Dry Years^(a,b)

Units: af/yr	2020	2025	2030	2035	2040
Available Potable Water Supply	19,595	19,595	19,595	19,595	19,595
Potable Water Demand (with Proposed Project) ^(c)	12,398	13,384	14,439	15,575	16,796
Potential Potable Water Surplus	7,196	6,211	5,156	4,020	2,799
Available Raw Water Supply	807	807	807	807	807
Raw Water Demand (with Proposed Project) ^(c)	807	807	807	807	807
Potential Raw Water Surplus	0	0	0	0	0
Available Recycled Water Supply ^(d)	7,813	10,419	10,419	10,419	10,419
Recycled Water Demand (with Proposed Project)	632	865	1,096	1,329	1,559
Potential Recycled Water Surplus	7,181	9,553	9,323	9,090	8,860

(a) Demands are from *City of Brentwood 2015 UWMP (Brown and Caldwell, 2016)*, Table 4-4. Projected water supplies are from Table 6-10 of the same document.

(b) Projected available water supply and water demands are assumed to be the same for normal, single dry, and multiple dry years.

(c) Projected raw water and potable water demands are not estimated separately in the City's 2015 UWMP. For this WSA, it was assumed that raw water demands will equal raw water supply, and that the remainder of the potable and raw water demands (as documented in the City's 2015 UWMP) are potable water demands.

(d) Values for projected recycled water supply are the total safe yield from the City's 2015 UWMP. A revised version of Table 6-9 from the City's 2015 UWMP assumed that the reasonably available volume of recycled water is equal to the projected recycled water demand. In either scenario, the projected recycled water supplies are adequate to meet the demands of the Proposed Project.

Water Supply Assessment Approval Process

The Brentwood City Council must approve this WSA at a regular or special meeting. Furthermore, the City must include this WSA in the Draft Environmental Impact Report (EIR) that is being prepared for the Proposed Project.

In addition, SB 221 applies to residential subdivisions of over 500 dwelling units and requires that the water supplier provide a written verification that the water supply for the project is sufficient, prior to issuance of the final permits. Because the Proposed Project includes up to 2,041 residential dwelling units, it is subject to the requirements of SB 221 (Government Code section 66473.7).

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1.0 INTRODUCTION

1.1 Legal Requirement for Water Supply Assessment

California Senate Bill 610 (SB 610) and Senate Bill 221 (SB 221) amended state law, effective January 1, 2002, to improve the link between information on water supply availability and certain land use decisions made by cities and counties. SB 610 and SB 221 were companion measures which sought to promote more collaborative planning between local water suppliers and cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. The purpose of this coordination is to ensure that prudent water supply planning has been conducted, and that planned water supplies are adequate to meet existing demands, anticipated demands from approved projects and tentative maps, and the demands of proposed projects.

SB 610 amended California Water Code sections 10910 through 10915 (inclusive) to require land use lead agencies to:

- Identify any public water purveyor that may supply water for a proposed development project; and
- Request a Water Supply Assessment (WSA) from the identified water purveyor.

The purpose of the WSA is to demonstrate the sufficiency of the purveyor's water supplies to satisfy the water demands of the proposed project, while still meeting the water purveyor's existing and planned future uses. Water Code sections 10910 through 10915 delineate the specific information that must be included in the WSA.

1.2 Need for and Purpose of Water Supply Assessment

The purpose of this WSA is to perform the evaluation required by Water Code sections 10910 through 10915 in connection with the City of Brentwood's (City) proposed Priority Area 1 Specific Plan (Proposed Project). It is not to reserve water, or to function as a "will serve" letter or any other form of commitment to supply water (see Water Code section 10914). The provision of water service will continue to be undertaken in a manner consistent with applicable City policies and procedures, consistent with existing law.

1.3 Water Supply Assessment Preparation, Format and Organization

The format of this WSA is intended to follow Water Code sections 10910 through 10915 to clearly delineate compliance with the specific requirements for a WSA. The WSA includes the following sections:

- Section 1: Introduction
- Section 2: Description of Proposed Project
- Section 3: Required Determinations
- Section 4: City of Brentwood Water Service Area

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- Section 5: City of Brentwood Water Demands
- Section 6: City of Brentwood Water Supplies
- Section 7: Determination of Water Supply Sufficiency Based on the Requirements of SB 610
- Section 8: Water Supply Assessment Approval Process
- Section 9: References

Relevant citations of Water Code sections 10910 through 10915 are included throughout this WSA in *italics* to demonstrate compliance with the specific requirements of SB 610.

2.0 DESCRIPTION OF PROPOSED PROJECT

2.1 Proposed Project Location

The Proposed Project is located within the City of Brentwood's (City) Sphere of Influence (SOI) and City Limits. The Proposed Project area includes approximately 290 acres of land located in the northwest corner of the City, south of Lone Tree Way, west of Shady Willow Lane, north of Old Sand Creek Road, and east of Heidorn Ranch Road (De Novo, 2014). To the north of the Proposed Project area are residential units and a commercial area located within the City of Antioch. To the west are residential units and undeveloped land located within the City of Antioch. To the south is undeveloped land within the City Limits designated for low density residential development by the City's General Plan as well as a developed commercial area (Streets of Brentwood). To the east are existing residential units, commercial areas, and an elementary school. Figure 2-1 depicts the vicinity of the Proposed Project.

Currently, the Proposed Project area is used for a variety of purposes, including agriculture, residential, and commercial uses. Two existing commercial areas, Lone Tree Plaza and Brentwood Station, are located in the northwest and northeast corners of the Proposed Project area, respectively, and will not be altered by the Proposed Project. State Route 4 traverses the Proposed Project area from north to south and bisects the area nearly in half (De Novo, 2014). A segment of Sand Creek is located in the southeast corner of the Proposed Project area.

The Proposed Project area is identified in the City's General Plan as Priority Area 1 (PA1). A Priority Area is an overlay designation that identifies an area of the City that warrants particular attention with respect to the land use mix, jobs and housing balance, and overall design and integration of future development projects. The Priority Area designation establishes a set of overarching guidance policies that shall be used by the City to ensure quality and integrated development that assists in meeting the economic development goals of the City's General Plan. Development within the Priority Area must be consistent with the underlying land use designations. (De Novo, 2014).

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Water Supply Assessment

2.2 Proposed Land Uses and Acreages

The Proposed Project will be a mixed-use development that will include approximately 1,400 medium and high density residential units, a transit station and approximately 630 associated residential units, a fire station, and commercial and light industrial development. The transit station is designed to accommodate a future eBart station and a park-and-ride facility. The residential units in the transit village will be vertical mixed-use residences, with residential units built on the upper floors of retail or office space. A new bicycle and pedestrian overcrossing of State Route 4 will be constructed near the Transit Station to connect portions of the Mokelumne Trail which are currently divided by the freeway. A new trail with a primarily north-south alignment will connect the Mokelumne Trail overcrossing with Brentwood Station.

Proposed land uses for the Proposed Project are summarized in Table 2-1 and shown on Figure 2-2.

Table 2-1. Proposed Land Uses for the Proposed Project^(a)		
Land Use	Approximate Area, acres	Projected Dwelling Units
Medium Density Residential (MDR)	27	405
High Density Residential (HDR)	40	1,005
Transit Village (TV) - Residential	20	631
Transit Village (TV) – Non-Residential	20	-
Regional Commercial (RC)	8	-
Employment Center/Light Industrial (ECLI)	154	-
Public Facility (Fire Station)	1	-
Transit Station	20	-
Existing Developed Areas (to remain), Roadways, Utilities and Other Infrastructure ^(b)	83	-
Total	373	2,041
(a) From Draft Land Use Plan for Priority Area 1 Specific Plan (De Novo, 2017).		
(b) Does not include State Route 4 right-of-way.		

2.3 Projected Water Demand

2.3.1 Water Use Factors and Assumptions

As part of the City's 2017 Water Master Plan (Ennis Consulting, 2017), the City used unit water use factors to estimate the water demands associated with land uses presented in the City's General Plan. These water use factors were derived from the 2006 Water System Master Plan model and were then adjusted accordingly to be in compliance with the Northern California Water Alliance–Land Use/Water Supply Analysis Guidebook (City of Brentwood 2017 WMP). Residential, Commercial, and Industrial water use factors are from Table 8 of the City's 2017 WMP. The Transit Village Residential units were assigned the water use factor for high density residential based on the projected dwelling unit density (32 DU/acre). For the non-residential portion of the transit center, the City's Commercial water use factor of 2,000 gpd/acre was assumed. For the transit station, the City's Public Facility water use factor of 1,000 gpd/acre was assumed.

It was assumed that recycled water will be used for all of the Proposed Project's irrigation demands, with the exception of irrigation demand for the medium density residential units. Projected irrigation demands were calculated using the methodology outlined in the City's Water Efficient Landscape Ordinance (WELO). It was assumed that irrigated area will be 10 percent of the total area for every land use type. The potential use of potable water supplies to meet non-potable water demands in the interim period before recycled water becomes available to the Proposed Project is described in Section 2.4.

Losses were assumed to be 12.5 percent of total water deliveries, based on raw and potable water use data from the City's 2015 UWMP (Brown and Caldwell, 2016). No data on losses for recycled water were available, so it was assumed that the losses for the recycled water system are also 12.5 percent of total recycled water deliveries.

Table 2-2 summarizes the unit water use factors for the land use designations applicable to the Proposed Project.

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Table 2-2. Water Use Factors for the Proposed Project

Land Use	Water Use Factor ^(a)	Units
Medium Density Residential (MDR)	450	gpd/DU
High Density Residential (HDR)	275	gpd/DU
Transit Village (TV) - Residential ^(b)	275	gpd/DU
Transit Village (TV) - Non-Residential ^(c)	2,000	gpd/acre
Regional Commercial (RC)	2,000	gpd/acre
Employment Center/Light Industrial (ECLI)	2,000	gpd/acre
Public Facility (Fire Station)	1,000	gpd/acre
Transit Station ^(d)	1,000	gpd/acre
Existing Developed Areas (to remain), Roadways, Utilities and Other Infrastructure	0	-
Losses ^(e)	12.5	percent of total water delivered

(a) Water use factors based on the *City of Brentwood's 2017 Water Master Plan*, Table 8. Water use factors for non-residential uses assumed to be based on gross area. Water use factors assumed to include irrigation demand.

(b) High Density Residential water use factor assumed based on housing unit density of 32 DU/acre.

(c) Commercial water use factor assumed.

(d) Public Facility water use factor assumed.

(e) Losses are assumed to be 12.5 percent of water deliveries. Based on the *City of Brentwood 2015 UWMP*, Table 4-1.

2.3.2 Water Demand Calculations

Based on the water use factors described above, the projected water demand at buildout of the Proposed Project is shown in Table 2-3. The detailed water demand projections for the Proposed Project are included in Appendix A. The total water demand for the Proposed Project at buildout is projected to be approximately 1,283 af/yr. Of this total water demand, the potable water demand at buildout is projected to be approximately 1,164 af/yr and the recycled water demand at buildout is projected to be approximately 119 af/yr.

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Table 2-3. Projected Water Demands for the Proposed Project

Land Use	Total Water Demand, af/year ^(a)	Potable Water Demand, af/year ^(b)	Recycled Water Demand, af/year ^(c,d)
Medium Density Residential (MDR) ^(e)	204.2	204.2	0.0
High Density Residential (HDR)	309.6	293.4	16.2
Transit Village (TV) - Residential	194.4	186.4	7.9
Transit Village (TV) - Non-Residential	44.2	36.2	7.9
Regional Commercial (RC)	18.8	15.4	3.4
Employment Center/Light Industrial (ECLI)	346	283.6	62.1
Public Facility (Fire Station)	1	0.7	0.4
Transit Station	22	14.4	8.1
Existing Developed Areas (to remain), Roadways, Utilities and Other Infrastructure	0	0	0.0
Subtotal	1,140	1,034	106
Losses ^(f)	143	129	13.2
Grand Total	1,283	1,164	119

(a) Based on water use factors presented in Table 2-2.
 (b) Potable water demand = total water demand – recycled water demand
 (c) Recycled water demand of 48.3 in/year/acre is based on the *City of Brentwood Water Efficient Landscape Ordinance* (City of Brentwood, 2017).
 (d) Recycled water assumed to be used for irrigation purposes for all proposed land use types, except for MDR land use type.
 (e) MDR land use type assumed to use potable water for irrigation, and therefore no non-potable demands are projected.
 (f) Losses are assumed to be 12.5 percent of water use. Based on the *City of Brentwood 2015 UWMP*, Table 4-1.

2.4 Projected Water Supply

Water demands for the Proposed Project will be served using the City’s existing and future portfolio of water supplies. The inclusion of existing and planned future water supplies is specifically allowed by the Water Code:

Water Code section 10631(b): Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

Recycled water infrastructure will need to be constructed to deliver recycled water supplies to the Proposed Project. The City’s 2015 UWMP recommends capital improvement projects for the development of the City’s recycled water system. Until such recycled water infrastructure is constructed, potable water supplies may be used in the interim to meet non-potable water demands within the Proposed Project.

Proponents of the Proposed Project will provide their proportionate share of required funding to the City for the acquisition and delivery of treated potable and recycled water supplies to the Proposed Project area.

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3.0 REQUIRED DETERMINATIONS

3.1 Does SB 610 apply to the Proposed Project?

10910 (a) Any city or county that determines that a project, as defined in Section 10912, is subject to the California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) under Section 21080 of the Public Resources Code shall comply with this part.

10912 (a) "Project" means any of the following:

- (1) A proposed residential development of more than 500 dwelling units.*
- (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.*
- (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.*
- (4) A proposed hotel or motel, or both, having more than 500 rooms.*
- (5) A proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.*
- (6) A mixed-use project that includes one or more of the projects specified in this subdivision.*
- (7) A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500-dwelling unit project.*

Based on the following facts, SB 610 does apply to the Proposed Project.

- The City of Brentwood has determined that the Proposed Project is subject to the California Environmental Quality Act (CEQA) and that an Environmental Impact Report (EIR) is required.
- The Proposed Project includes residential, commercial, and light industrial land uses, and therefore is a mixed-use project. The residential development portion of the Proposed Project includes 2,041 residential dwelling units and therefore meets the definition of a "Project" as specified in Water Code section 10912(a) paragraph (1) as defined for residential development. The Proposed Project therefore meets the definition of a "Project" as specified in Water Code section 10912(a) paragraph (6) for mixed-use projects.

The Proposed Project has not been the subject of a previously adopted WSA and has not been included in an adopted WSA for a larger project. Therefore, according to Water Code section 10910(a), a WSA is required for the Proposed Project.

3.2 Who is the Identified Public Water System?

10910(b) The city or county, at the time that it determines whether an environmental impact report, a negative declaration, or a mitigated negative declaration is required for any project subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Code, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined by Section 10912, that may supply water for the project

10912 (c) "Public water system" means a system for the provision of piped water to the public for human consumption that has 3,000 or more service connections...

As shown on Figure 2-1, the Proposed Project is located within the City of Brentwood Limits. The City's water system service area includes all areas within the City Limits. Therefore, the City is the identified public water system for the Proposed Project.

3.3 Does the City have an adopted Urban Water Management Plan (UWMP) and does the UWMP include the projected water demand for the Proposed Project?

10910(c)(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the most recently adopted urban water management plan adopted pursuant to Part 2.6 (commencing with Section 10610).

The City's most recently adopted UWMP (the City's 2015 UWMP) was adopted by the Brentwood City Council in June 2016 and is incorporated by reference into this WSA¹. The City's 2015 UWMP included water demand projections for current water demands within the City (baseline demand) and anticipated water demands associated with future development projects and planning areas within the City's General Plan Sphere of Influence through 2040.

Water demands for the Proposed Project are not specifically designated in the City's 2015 UWMP. However, Figure 3-2 of the City's 2015 UWMP depicts future pipelines in the Proposed Project area, indicating that the City anticipated serving this area in the future, and included the area in general population and water demand growth projections. Therefore, the Proposed Project is implicitly included in the City's 2015 UWMP. The City's ability to meet the projected water demands for the Proposed Project is described in Section 7.0 of this WSA.

¹ City of Brentwood 2015 Urban Water Management Plan, prepared by Brown and Caldwell, June 2016.

4.0 CITY OF BRENTWOOD WATER SERVICE AREA

4.1 Water Service Area

The City of Brentwood is located in Eastern Contra Costa County, California, and was incorporated in 1948. The existing incorporated area of the City encompasses approximately 14.8 square miles. The City's General Plan includes the City's Sphere of Influence (SOI), the area outside of the City limits that the City expects to annex and urbanize in the future. The City's SOI encompasses an area of approximately 17.4 square miles and is 2.6 square miles larger than the current City limits. (City of Brentwood 2015 UWMP)

With a few exceptions, the City's water service area is coterminous with the City Limits. As future developments within the SOI, but outside the City Limits, are approved, they will be annexed into the City and served by the City water system. Figure 2-1 illustrates the current City Limits and the SOI.

4.2 Population

When the City of Brentwood was incorporated in 1948, it had a population of 1,700. During the late 1990's and early 2000's the City's population grew rapidly, from 7,563 in 1990 to 51,481 in 2010 (De Novo, 2013). The City experienced a dramatic economic boom from 2000 through 2008, which contributed substantially to the high growth rate. This growth stalled in 2009 in response to changes in the U.S. economy, particularly the real estate market collapse in California. As a result, the City experienced a 1 percent decrease in population from 2009 to 2010. Since then, the annual growth rate has averaged 1.6 percent before peaking in 2015 at 2.8 percent. Moving forward, the annual growth rate is projected to average approximately 1.5 percent, with the City's population projected to reach 80,917 citizens at build out. (City of Brentwood 2015 UWMP)

Current population data for the City came from the California Department of Finance Demographic Research Unit (DRU) as control totals for each jurisdiction. Data from DRU were also used to project future population growth. Economic and demographic mathematical models are used to drive population projections. These models can be adjusted by considering historical and present trends, taking into account available vacant land, redevelopment activities, and current land use policies and plans. The City expects 9,348 new residents over the next decade, based on the number of new single-family houses and multi-family permits projected to be approved through 2024. (City of Brentwood 2015 UWMP)

Demographic factors that affect water management planning include the uncertainty in estimating future population growth and per capita water use. Affordability of housing has many people choosing to reside in Brentwood. Even though population and employment rates in the City continue to grow, nearly 75 percent of Brentwood residents commute to jobs outside of the City. The largest employers within the City are community-service retail and government employers. While agriculture remains important to the local economy, it has declined in relative importance as the City has become more suburban. The City has no heavy industry and only a small light industry area in the northeastern part of the City. Changes in the economy can have a strong impact on growth. (City of Brentwood 2015 UWMP)

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Table 4-1 shows the City’s projected population in five-year increments to the year 2040.

Table 4-1. City of Brentwood Existing and Projected Population						
Year	2015	2020	2025	2030	2035	2040
Population Projection ^(a)	56,493 ^(b)	60,702	65,225	70,084	75,306	80,917
(a) From <i>City of Brentwood 2015 UWMP</i> , Table 3-2. (b) Actual 2015 population.						

4.3 Climate

The City has cool, humid winters, and hot, dry summers. Based on the historical data obtained from the California Irrigation Management Information System, the City’s average daily temperature ranges from 37 to 90°F; the extreme low and high temperatures have been 11 and 109°F, respectively, over the time period from January 1986 to December 2015. The rainy season typically begins in November and ends in March. Average monthly precipitation during the winter months is about 2 to 3 inches, but records show that the monthly winter precipitation has been as high as 8 inches (in February 1998) and as low as 0 inches (multiple months). Water demands during the winter are low relative to summer months (May to September). The combination of hot and dry weather during the summer results in high water demands during these periods. Landscape irrigation, including turf irrigation in the summer, significantly contributes to the higher summer demands. (City of Brentwood 2015 UWMP)

Evapotranspiration records, which measure the loss of water from the soil both by evaporation and by transpiration from the plants growing thereon, indicate average monthly values ranging from 1.0 inches in the City’s wet Januarys to 7.9 inches in much drier Julys.

Table 4-2 summarizes the City’s average temperature and rainfall data. Temperature and rainfall data was obtained from the City’s 2015 UWMP. Evapotranspiration data was obtained from the City’s Water Efficient Landscape Ordinance (2017).

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Table 4-2. City of Brentwood Climate Data

	Average ET _o , inches ^(a)	Average Rainfall, inches ^(b)	Average Max Temperature, F ^(b)	Average Min Temperature, F ^(b)
Jan	1.0	2.34	55.49	39.19
Feb	1.5	2.31	59.24	40.22
Mar	2.9	1.32	64.91	43.19
Apr	4.5	0.74	69.48	44.76
May	6.1	0.56	75.76	48.45
Jun	7.1	0.29	82.62	51.04
Jul	7.9	0.10	87.59	54.61
Aug	6.7	0.13	89.94	55.60
Sep	5.3	0.26	86.11	53.89
Oct	3.2	0.74	77.35	48.92
Nov	1.4	1.22	64.73	41.87
Dec	0.7	2.40	54.95	37.17
Annual Total	48.3	12.41	-	-

(a) From *City of Brentwood Water Efficient Landscape Ordinance*, Appendix A
(b) *City of Brentwood 2015 UWMP*, Table 3-1.

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5.0 CITY OF BRENTWOOD WATER DEMANDS

10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).

The descriptions provided below for the City’s water demands have been taken, for the most part, from the City’s 2015 UWMP, which was adopted in June 2016. Supplemental information from other available reports has been included to provide the most recent data available and to meet the specific requirements of SB 610.

5.1 Historical and Existing Water Demand

In recent years, the City’s water demand has decreased as a result of the economic downturn of 2008 through 2011 and water use reductions in response to recent drought conditions. Table 5-1 shows the City’s historical water demands for 2005, 2010, and 2015. Historical water deliveries were obtained from the City’s annual reports sent to DWR and the California Department of Public Health/State Water Resources Control Board Division of Drinking Water.

Table 5-1. Historical Water Demand			
	2005^(a)	2010^(a)	2015^(b)
Total Potable and Raw Water Demand, af/yr ^(c)	11,910	11,714	8,918
Total Recycled Water Demand, af/yr ^(c)	-	-	399
Total Water Demand, af/yr	11,910	11,714	9,317
(a) Historical Water Delivery data for 2005 and 2010 is from the <i>City of Brentwood 2010 UWMP</i> (ICF International, 2011), Table 4-6 and Table 4-7. (b) Historical Water Delivery data for 2005 and 2015 is from the <i>City of Brentwood 2015 UWMP</i> , Table 4-1 and Table 4-4. (c) Recycled Water Demand was not tracked separately for 2005 and 2010, and is included in the potable and raw water demand for these years.			

5.2 Future Water Demand

The City’s water demand is anticipated to continue to increase as approved projects build out and new developments are approved and constructed in accordance with the City’s General Plan within the City’s water service area. Based on the City’s General Plan, the projected average annual water use at buildout was approximately 21,800 acre-feet per year. The City’s General Plan tabulated this buildout demand using the City’s average per capita baseline water use of 241 gallons per capita per day (gpcd) that occurred from 2001 through 2010. With the onset of the drought, the City’s per capita demand has decreased substantially. While a rebound in per capita water use from drought to pre-drought levels is expected, water use is not likely to increase back to the 241 gpcd baseline. Instead, normal year water demands through 2040 are projected based on assuming per capita demands will increase back to approximately 90 percent of the 2012 gpcd and the projected population. This approach is based on the assumption that 2012 was a normal water demand year and that some conservation measures implemented by the City and its customers during the

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drought are permanent and will result in some level of continued reduced water demands into the future. (City of Brentwood 2015 UWMP)

The City has developed preliminary planning documents to identify uses for recycled wastewater at both existing and future sites. Recycled wastewater is projected to primarily be used for the irrigation of parks and landscape amenities. The City already has constructed a portion of the recycled water distribution system and will continue to expand the system as the City grows. The City has identified several parks that have the potential to be served with recycled water. Recycled water demands were estimated to be 2,111 af/yr at buildout. However, expansion of the recycled water system to meet the demand for some customers will likely come at a high cost per acre-foot of demand added. A buildout (2040) demand totaling 1,560 af/yr was deemed more feasible. (City of Brentwood 2015 UWMP)

Table 5-2 shows the projected potable and recycled water demand through 2040 as presented in the City’s 2015 UWMP.

	2020	2025	2030	2035	2040
Total Potable and Raw Water Demand, af/yr	13,205	14,191	15,246	16,382	17,603
Total Recycled Water Demand, af/yr	632	865	1,096	1,329	1,559
Total Water Demand, af/yr	13,838	15,056	16,342	17,711	19,162

(a) Data from the *City of Brentwood 2015 UWMP*, Table 4-4.

5.3 Dry Year Water Demand

As shown in Table 5-1, the City’s 2015 demand was significantly lower than the 2010 demand in response to the drought and the Governor’s April 2015 Executive Order B-29-15 mandating 25 percent water conservation statewide. To reduce water use by 25 percent statewide, the SWRCB adopted a regulation which placed each urban water supplier into one of nine tiers which are assigned a conservation standard, ranging between 4 percent and 36 percent. Each month, the SWRCB compared every urban water suppliers’ water use with their use for the same month in 2013 to determine if they were on track for meeting their conservation standard. The City of Brentwood was initially placed into Tier 8 with a water conservation standard of 32 percent as compared to 2013 use (the City’s conservation standard was reduced to 28 percent in early 2016) (SWRCB, 2015; SWRCB, 2016).

In response, the City adopted a Resolution at their April 28, 2015 Council meeting requiring customers to reduce potable water use by 35 percent relative to the amounts they used in 2013. Besides implementing the mandatory restrictions set by the State, the City increased the frequency of their water conservation workshops and disseminated additional information to the public encouraging water conservation. Penalties were levied to those customers that were non-compliant with the mandatory 35 percent reduction. Water use in 2015 reflects water conservation efforts as

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a result of the Governor’s Executive Order precipitated by a four-year drought in California. (City of Brentwood 2015 UWMP)

The City currently has a demand management program in place, as described in Section 9 of the City’s 2015 UWMP. The projected future water demand presented in Table 5-2 includes continued implementation of the City’s existing demand management program, and is based on future normal hydrologic years. The City’s Water Shortage Contingency Plan, outlined in Section 8 of the City’s 2015 UWMP, includes a four-stage plan describing specific actions to reduce water demand by up to 50 percent in the event of a water supply shortage or emergency. In the City’s 2015 UWMP and this WSA, the additional water conservation which may occur in single dry or multiple dry years is not assumed to happen. This is a conservative assumption, as additional water conservation may indeed occur as a result of the City’s implementation of additional water conservation measures in response to multiple dry years or other water supply shortages.

Table 5-3 presents the projected future dry year potable water demand.

Hydrologic Condition	Demand Reduction ^(a)	2020	2025	2030	2035	2040
Single Dry Year ^(b) , af/yr	0%	13,838	15,056	16,342	17,711	19,162
Multiple Dry Years, af/yr ^(b,c)	0%	13,838	15,056	16,342	17,711	19,162

(a) Conservatively assumes no demand reduction in dry years. Demands may be reduced in dry years as a result of the City’s implementation of its Water Shortage Contingency Plan; however, such a demand reduction is not assumed or relied upon for the purposes of the Single Dry Year and Multiple Dry Year evaluations for this WSA.

(b) Data from the City of Brentwood 2015 UWMP, Table 4-4.

(c) Represents demands for each year of the 3-year multiple dry year period.

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6.0 CITY OF BRENTWOOD WATER SUPPLIES

10910(c)(2) If the projected water demand associated with the proposed project was accounted for in the most recently adopted urban water management plan, the public water system may incorporate the requested information from the urban water management plan in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f) and (g).

10910(d)(1) The assessment required by this section shall include an identification of any existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project, and a description of the quantities of water received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts

10910(d)(2) An identification of existing water supply entitlements, water rights, or water service contracts held by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall be demonstrated by providing information related to all of the following:

- (A) Written contracts or other proof of entitlement to an identified water supply.*
- (B) Copies of a capital outlay program for financing the delivery of a water supply that has been adopted by the public water system.*
- (C) Federal, state, and local permits for construction of necessary infrastructure associated with delivering the water supply.*
- (D) Any necessary regulatory approvals that are required in order to be able to convey or deliver the water supply.*

10910(e) If no water has been received in prior years by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), under the existing water supply entitlements, water rights, or water service contracts, the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), shall also include in its water supply assessment pursuant to subdivision (c), an identification of the other public water systems or water service contract-holders that receive a water supply or have existing water supply entitlements, water rights, or water service contracts, to the same source of water as the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has identified as a source of water supply within its water supply assessments.

It is anticipated that the Proposed Project, if approved by the City, would be served from City's existing and future portfolio of water supplies. The inclusion of existing and planned future water supplies is specifically allowed by the Water Code:

Water Code section 10631(b): Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

The water supply for the Proposed Project will have the same water supply reliability and water quality as the water supply available to the City's other existing and future water customers. Proponents of the Proposed Project will provide their proportionate share of required funding to the City for the acquisition and delivery of treated potable and recycled water supplies to the Proposed Project area.

The water supplies needed to serve the Proposed Project (together with existing water demands and planned future uses) are described in the City's 2015 UWMP. Therefore, the descriptions provided below for the City's water supplies have been taken, for the most part, from the City's 2015 UWMP, which was adopted in June 2016. Supplemental information from other available reports has also been included to provide the most recent data available and to meet the specific requirements of SB 610.

6.1 Existing Water Supplies

The City currently receives water supplies from five sources:

- Surface water from the Delta purchased from East Contra Costa Irrigation District (ECCID). This water is delivered to the city by three separate sources:
 - Surface water treated at the Randall-Bold Water Treatment Plant, which receives water from the Contra Costa Canal.
 - Surface water treated at the City of Brentwood Water Treatment Plant, which receives water from the Contra Costa Canal.
 - Raw water used for non-potable uses, delivered via the ECCID Canal.
- Groundwater pumped from groundwater wells located within the City.
- Recycled water treated at the City of Brentwood WWTP. This water may only be used for non-potable uses.

Each of these existing supplies is described below.

6.1.1 ECCID Surface Water

In 1999, the City entered into an agreement with ECCID that provides the City with a permanent entitlement to purchase 14,800 af/yr of surplus irrigation water from the Delta. ECCID has pre-1914 water rights, which are not subject to delivery reductions during water shortages, including regulatory restricted and drought years. The water purchased by the City may only be used by the City and its retail customers within the City limits or within the ECCID service area. Surface water supplies for the City originate from Rock Slough or Indian Slough. The majority of the supply is transported through the Contra Costa Canal for treatment at either the Randall-Bold Water Treatment Plant (RBWTP) or the City of Brentwood Water Treatment Plant (COBWTP). A small portion of the supply is transported through the ECCID Canal for distribution for non-potable uses. (City of Brentwood 2015 UWMP)

6.1.1.1 Purchased Potable Water from the Randall-Bold Water Treatment Plant

The City has purchased a permanent capacity share of 6 mgd at the Randall-Bold Water Treatment Plant and may use additional capacity on an as-need basis. The City uses the entire 6 mgd, but does not project to use additional capacity in future years. Contra Costa Water District (CCWD) has operated the RBWTP since 1992. The RBWTP has a design capacity to treat up to 40 mgd. The RBWTP is jointly owned by Diablo Water District (DWD) and CCWD. The City receives water from the CCWD portion of the facility. Raw water is pumped to the RBWTP from the Rock Slough intake via the Contra Costa Canal, which is operated by CCWD, for treatment prior to distribution to a public water supply. Water can also be stored in the off-stream Los Vaqueros Reservoir from the Old River and Middle River intakes. During periods of low salinity in the Delta, raw water is pumped into the Los Vaqueros Reservoir and stored for future use. This stored water is supplied to the Contra Costa Canal and blended with raw water from the Rock Slough intake as needed. (City of Brentwood 2015 UWMP)

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6.1.1.2 Potable Water from the City of Brentwood Water Treatment Plant

The City of Brentwood Water Treatment Plant was built in 2008 to serve the City. The City and the CCWD constructed the COBWTP as a joint venture. The completed first phase of the COBWTP, which has been constructed and is in operation, can treat up to 16.5 mgd of surface water. However, the COBWTP is designed so that it can be expanded to an ultimate capacity of 33 mgd to serve a portion of the City's projected water demands through 2040. COBWTP processes include flocculation, sedimentation, ozonation, filtration, and disinfection. (City of Brentwood 2015 UWMP)

6.1.1.3 Raw Water from the ECCID Canal

The City obtains raw surface water for non-potable landscape irrigation from the ECCID Canal, which diverts water from the Indian Slough on the Old River. Water is pumped to the non-potable irrigation system via the Roddy Ranch Pump Station, located on the canal. Current users include golf courses, parks, schools, and commercial landscape areas. The City purchased 822 acre-feet in 2015. The City projects a purchase of about 807 acre-feet per year for 2020 through 2040, based on the assumption that 10 percent of the ECCID water entitlement allocated to the COBWTP will be used for non-potable uses (City of Brentwood 2015 UWMP, Table 6-10).

6.1.2 Groundwater

10910(f) If a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment.

10910(f)(1) A review of any information contained in the urban water management plan relevant to the identified water supply for the proposed project.

10910(f)(2) A description of any groundwater basin or basins from which the proposed project will be supplied. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current bulletin of the department that characterizes the condition of the groundwater basin, and a detailed description by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), of the efforts being undertaken in the basin or basins to eliminate the long-term overdraft condition.

10910(f)(3) A detailed description and analysis of the amount and location of groundwater pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), for the past five years from any groundwater basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the public water system, or the city or county if either is required to comply with this part pursuant to subdivision (b), from any basin from which the proposed project will be supplied. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historical use records.

10910(f)(4) An analysis of the sufficiency of the groundwater from the basin or basins from which the proposed project will be supplied to meet the projected water demand associated with the proposed project.

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A water assessment shall not be required to include the information required by this paragraph if the public water system determines, as part of the review required by paragraph (1), that the sufficiency of groundwater necessary to meet the initial and projected water demand associated with the project was addressed in the description and analysis required by paragraph (4) of subdivision (b) of Section 10631.

6.1.2.1 Groundwater Overview

The City pumps groundwater from a portion of the Tracy Subbasin San Joaquin Valley Groundwater Basin underlying the City. The City's 2015 UWMP states that the City has nine permitted groundwater wells within its service area, seven of which are active wells. The City treats groundwater with chloramines at the wellheads prior to delivery to the drinking water distribution system. The City has two main well fields. Wells 6, 7, 8, 14, and 15 are located in the northeast part of the City, and Wells 11, 12 and 13 are in the south part of the City. The total design capacity of the wells is 6.63 mgd. The firm design capacity of the wells, where firm capacity is the capacity of all the wells minus the capacity of the largest well, is 5.19 mgd. Of the two wells that are not in use, Well 9 does not have a disinfection system, and Well 11 is not used because of high nitrate concentrations at this location.

The City's 2017 WMP states that the City only has eight groundwater wells within its service area, five of which are active wells. Well 9 is not mentioned in the 2017 WMP, and it unclear if this well was abandoned or destroyed after the 2015 UWMP was written. Wells 11, 12, and 13 are listed as inactive. The 2017 WMP gives the total capacity of the five wells as 7.2 mgd, which is inconsistent with the lower capacity provided in the 2015 UWMP, given that fewer wells are listed as operating in the 2017 WMP.

For the purposes of this WSA, it is assumed that the capacities given in the 2015 UWMP are correct, as this is the more conservative approach for the purpose of determining if the City has adequate water to supply the Proposed Project.

6.1.2.2 Basin Description

The City's wells are located within the northwest part of the Tracy Subbasin of the San Joaquin Valley Groundwater Basin. The following section describes the Tracy Subbasin, including its water-bearing formations, water levels, and water quality. Much of the following information has been incorporated from the City's 2015 UWMP. Except where noted, the description of the sub-basin is based largely on information provided in the 2003 DWR Bulletin 118, in which the groundwater basin description was last updated in January 2006.

The Tracy Subbasin is not adjudicated and there are no legal restrictions to groundwater pumping. The Tracy Subbasin has a total area of 539 square miles and is bounded by the Diablo Range of the Coast Range foothills to the west, the San Joaquin and Mokelumne Rivers on the north, the San Joaquin River to the east, and the San Joaquin-Stanislaus county line to the south. The Tracy Subbasin is comprised of continental deposits of Late Tertiary to Quaternary age. These deposits include the Tulare Formation, Older Alluvium, Flood Basin Deposits, and Younger Alluvium. The cumulative thickness of these deposits increases from a few hundred feet near the Coast Range foothills on the west to about 3,000 feet along the eastern margin of the sub-basin. The City's wells range in depth from 200 to 660 feet, and draw from the Tulare Formation.

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Each of these formations is described below:

- The Tulare Formation is exposed in the Coast Range foothills along the western margin of the sub-basin and dips eastward toward the axis of the San Joaquin Valley. The Tulare Formation is approximately 1,400 feet thick and consists of semi-consolidated, poorly sorted, discontinuous deposits of clay, silt, and gravel. The Corcoran Clay occurs near the top of the Tulare Formation and confines the underlying fresh water deposits. The eastern limit of the Corcoran Clay is near the eastern boundary of the sub-basin. The Tulare Formation is moderately permeable, with most of the larger agricultural, municipal, and industrial wells completed below the Corcoran Clay and capable of producing up to about 3,000 gallons per minute (gpm). Smaller, domestic wells are typically completed above the Corcoran Clay, where the groundwater is often of poor quality. Specific yield values for the Tulare Formation in the San Joaquin Valley and Delta area range from 7 to 10 percent.
- The Older Alluvium is approximately 150 feet thick and consists of loosely to moderately compacted sand, silt, and gravel deposited in alluvial fans during the Pliocene and Pleistocene eras. The Older Alluvium is widely exposed between the Coast Range foothills and the Delta and is moderately to locally highly permeable.
- The Flood Basin Deposits occur in the Delta portion of the sub-basin and are the distal equivalents of the Tulare Formation and Older and Younger alluvial units. The Flood Basin Deposits consist primarily of silts and clays with occasional interbeds of gravel along the present waterways. Because of their fine-grained nature, the Flood Basin Deposits have low permeability and generally yield low quantities of water to wells. Occasional zones of fresh water are found in the Flood Basin Deposits, but they generally contain poor quality groundwater. The maximum thickness of the Flood Basin Deposits is about 1,400 feet.
- The Younger Alluvium includes those deposits that are currently accumulating, including sediments deposited in the channels of active streams, as well as overbank deposits and terraces of these active streams. The Younger Alluvium, consisting of unconsolidated silt, fine- to medium-grained sand, and gravel, is present to depths of less than 100 ft below ground surface (bgs) along the channel of Corral Hollow Creek. Sand and gravel zones in the Younger Alluvium are highly permeable and, where saturated, yield significant quantities of water to wells.

6.1.2.3 Conditions of Overdraft

There are no published groundwater storage values for the entire Tracy Subbasin. A DWR review of hydrographs for the Tracy Subbasin indicate that the majority of the water levels in wells remained relatively stable over the 10-year period prior to 2006. Seasonal variation resulting from recharge and pumping was evident, but levels were stable overall. In general, conditions since the late 1950's compared to present indicate that the groundwater system has no apparent overdraft, suggesting that historical extraction patterns have not exceeded the safe yield of the basin. A groundwater budget, estimating the subbasin inflows and outflows, has not been prepared for the subbasin. (City of Brentwood 2015 UWMP)

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The Sustainable Groundwater Management Act (SGMA) directs DWR to identify groundwater basins and subbasins that are in conditions of critical overdraft. This designation is determined based upon the presence of "undesirable impacts" such as seawater intrusion, land subsidence, groundwater depletion, and chronic lowering of groundwater levels. Per DWR's current list of critically overdrafted basins, finalized in January 2016, the Tracy Subbasin is NOT designated as a critically overdrafted basin. (City of Brentwood 2015 UWMP)

As part of the California Statewide Groundwater Elevation Monitoring (CASGEM) Program, DWR is required to prioritize California groundwater basins to help identify, evaluate, and determine the need for additional groundwater level monitoring. Per the current CASGEM prioritization, finalized in June 2014, the Tracy Subbasin is a medium priority subbasin. (City of Brentwood 2015 UWMP)

6.1.2.4 Groundwater Management

The City does not currently have a groundwater management plan, but has several ongoing investigations on both groundwater supply and quality within the City's service area. (City of Brentwood 2015 UWMP). The City of Brentwood became a single-agency Groundwater Sustainability Agency in May 2017 (DWR, 2018). As a medium priority basin, not subject to critical conditions of overdraft, the Tracy Subbasin must be managed under a Groundwater Sustainability Plan by January 31, 2022 (DWR, 2016a).

6.1.2.5 Historical Groundwater Use

As discussed previously, the City has nine permitted groundwater wells, seven of which are active, according to the 2015 UWMP. The City's groundwater production over the last five years is provided in Table 6-1.

Table 6-1. City of Brentwood Historical Groundwater Production					
	2013 ^(a)	2014 ^(a)	2015 ^(a)	2016 ^(b)	2017 ^(b)
Total Groundwater Production, af/yr	5,119	4,502	2,541	1,328	2,081
<small>(a) From <i>City of Brentwood 2015 UWMP</i>, Table 6-2. (b) Provided by the City of Brentwood, January 16, 2018.</small>					

6.1.2.6 Projected Future Groundwater Use

The City plans to pump groundwater at an estimated rate of 5 mgd through 2040. This rate is slightly less than the firm yield of the City's active wells, as estimated by the City's 2015 UWMP. The amount of groundwater pumped during dry years is not projected to differ from the amount pumped during normal years. The City's projected future groundwater production through 2040 is provided in Table 6-2.

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Table 6-2. City of Brentwood Projected Future Groundwater Production in Normal and Dry Years^(a)					
	2020	2025	2030	2035	2040
Total Groundwater Production During a Normal Year, af/yr ^(b)	5,601	5,601	5,601	5,601	5,601
Total Groundwater Production During Dry Years, af/yr ^(b)	5,601	5,601	5,601	5,601	5,601

(a) From *City of Brentwood 2015 UWMP*, Table 6-10.
 (b) The firm design capacity of the City's wells is 5.19 mgd, this total assumes wells are pumping at 5 mgd.

6.1.2.7 Groundwater Sufficiency

The City's 2015 UWMP addressed the sufficiency of the City's groundwater supplies, in conjunction with the City's other existing and additional water supplies, to meet the City's existing and planned future uses. Based on the information provided above and that included in the City's 2015 UWMP, the City's groundwater supply, together with the City's other existing and additional planned future water supplies, is sufficient to meet the water demands of the Proposed Project, in addition to the City's existing and planned future uses. See Section 7 for a detailed determination of the sufficiency of the City's water supply portfolio, including groundwater, to meet the demands of the Proposed Project.

6.1.3 Wastewater and Recycled Water

The City's WWTP receives, treats, and discharges municipal wastewater that is generated, collected, and treated within the City's service area. The WWTP is capable of producing tertiary filtered and disinfected water which meets Title 22 standards for unrestricted non-potable reuse. The WWTP has an average dry weather flow capacity of 5 mgd and was designed to be expandable to an average dry weather flow capacity of 10 mgd. Wastewater from the City that is not reused is treated and discharged to Marsh Creek, which drains to Big Break in the Delta. (City of Brentwood 2015 UWMP)

The recycled water produced by the WWTP may be used for all outdoor irrigation demands in a community, including parks, schools, street medians, residential front and backyard landscaping, and public open space. The recycled water may also be used for industrial uses such as cooling, and for environmental purposes such as wetland and habitat restoration. The recycled water is distributed through its non-potable water supply system. This system includes both recycled water and the raw water supplied by ECCID. The system delivers water for irrigation and includes a network of transmission and distribution pipelines and pump stations.

6.2 Future Water Projects

The inclusion of planned future water supplies in this WSA is specifically allowed by the Water Code:

Water Code section 10631(b): Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).

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The City has a number of future capital improvement projects planned to maintain and upgrade existing water supply and distribution facilities. However, only one of these projects, the Wastewater Treatment Plant Expansion, has the potential to provide additional future water supply for the City. Phase II of the WWTP Expansion will expand the capacity of the WWTP to 7.5 mgd, and is expected to be completed by 2020. Phase III of the WWTP Expansion will expand the capacity of the WWTP to 10 mgd, and is expected to be completed by 2025. Expanding the capacity of the WWTP increases the potential amount of recycled wastewater available for non-potable use.

6.3 Summary of Existing and Additional Planned Future Water Supplies

Table 6-3 provides a summary of the City’s 2015 water supply deliveries and projected future available water supply available. A discussion of the future anticipated availability of these existing and additional planned future water supplies during dry years is provided in the next section.

Units: af/yr	2015 ^(a)	2020 ^(b)	2025 ^(b)	2030 ^(b)	2035 ^(b)	2040 ^(b)
Groundwater Production ^(c)	2,541	5,601	5,601	5,601	5,601	5,601
ECCID Surface Water, Treated at COBWTP ^(d)	3,391	7,273	7,273	7,273	7,273	7,273
ECCID Surface Water, Treated at RBWTP ^(d)	2,164	6,721	6,721	6,721	6,721	6,721
Total Potable Water Supply	8,096	19,595	19,595	19,595	19,595	19,595
ECCID Raw Water ^(d)	822	807	807	807	807	807
Recycled Water from City WWTP ^(e)	399	7,813	10,419	10,419	10,419	10,419
Total Water Supply	9,317	28,215	30,821	30,821	30,821	30,821

(a) Actual 2015 water supplies delivered. From *City of Brentwood 2015 UWMP*, Table 6-9.

(b) Projected water supplies available. From *City of Brentwood 2015 UWMP*, Table 6-10.

(c) The firm design capacity of the City's wells is 5.19 mgd, this total assumes wells are pumping 5 mgd.

(d) The total ECCID purchase entitlement is 14,800 af/yr. A portion of this water is treated at RBWTP (6 mgd) and the rest of the total was split between potable and non-potable supplies based on actual 2012 water use. It was assumed that ten percent of the ECCID supply allocated to the COBWTP will be used for non-potable use.

(e) The total recycled water supply is assumed to be 93 percent of the total WWTP capacity. It is assumed the City will expand the WWTP capacity to 7.5 mgd by 2020 and up to 10 mgd by 2025.

(f) Values for projected recycled water supply are the total safe yield from the City's 2015 UWMP. A revised version of Table 6-9 from the City's 2015 UWMP assumed that the reasonably available volume of recycled water is equal to the projected recycled water demand. In either scenario, the projected recycled water supplies are adequate to meet the demands of the Proposed Project.

6.4 Water Supply Availability and Reliability

Water Code section 10910 (c)(4) requires that a WSA include a discussion with regard to “whether total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned

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future uses, including agricultural and manufacturing uses.” Accordingly, this WSA addresses these three hydrologic conditions through the year 2040.

Also, in response to on-going drought conditions and the State of Emergency proclaimed by Governor Brown, first in January 2014 and most recently in April 2015, this WSA provides a discussion of the availability and reliability of the City’s available water supplies to meet the City’s water demands in the event that the City’s surface water supplies are limited under emergency water supply conditions.

6.4.1 Normal, Single Dry, and Multiple Dry Years

The reliability of each of the City’s existing and additional planned water supplies and their projected availability during normal, single dry, and multiple dry years, as described in Section 7 of the City’s 2015 UWMP, is described below and summarized in Table 6-4. The City has always met system water demand, regardless of regional hydrology. The City expects no reductions from normal-year supply during single or multiple dry years, as described in detail below. (City of Brentwood 2015 UWMP)

Because ECCID holds pre-1914 water rights, the City’s surface water supply is not subject to delivery reductions during water shortages, including regulatory restricted and drought years. Water quality issues are not anticipated to affect this source. Raw water from the Delta is considered a high-quality source and characterized by low to moderate levels of turbidity, minerals, and natural organic matter. Pathogenic organisms tend to be present in low concentrations as well. Other pollutants, such as pesticides, are typically not detected. Both the COBWTP and RBWTP are amply equipped to handle fluctuations in raw water quality and consistently produce a high-quality effluent. (City of Brentwood 2015 UWMP)

Contra Costa County does not regulate groundwater pumping with water rights, and the San Joaquin basin is not adjudicated. While DWR has not designated the San Joaquin Basin in overdraft and current groundwater levels and raw water delivery rates are assumed to be constant for the 2015 UWMP, the City is aware that future conditions may vary. Environmental factors, such as drought conditions, and water quality factors, such as groundwater contamination, have the potential to affect this resource adversely. The City is prepared to manage any changes that may occur due to extended drought or potential effects of climate change adaptively via conservation measures and an increased use of recycled water (City of Brentwood 2015 UWMP). For the purposes of this WSA, it is assumed that the basin will not be placed in a condition of critical overdraft and that water quality issues will not affect the supply. Therefore, groundwater supply is not projected to be affected during single dry or multiple dry years.

The supply of recycled water produced by the City’s WWTP should be unaffected by single or multiple dry years. While the supply of wastewater used to produce the recycled water may decrease somewhat if voluntary or mandatory conservation measures are enacted, the amount of wastewater collected by the plant far exceeds the projected demands for recycled water through 2040, as shown in Table 7-1.

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Table 6-4. Water Supply Reliability in Single Dry and Multiple Dry Years		
Supply Source	Anticipated Reliability (% of Supply in a Normal Year) ^(a)	
	Single Dry Years	Multiple Dry Years
Groundwater Production	100	100
ECCID Surface Water, Treated at COBWTP	100	100
ECCID Surface Water, Treated at RBWTP	100	100
ECCID Raw Water	100	100
Recycled Water from City WWTP	100	100

(a) See Table 6-3 for Projected Water Supply in a Normal Year

6.4.2 Emergency Water Supply Conditions

The City’s 2015 UWMP includes a Water Shortage Contingency Plan (WSCP) to address situations when catastrophic water supply interruptions occur due to regional power outage, earthquake, or other disasters; and when drought occurs. The City’s WSCP includes an analysis of existing and projected water demands and supplies, a water conservation and rationing plan with mandatory prohibitions and penalties, and an analysis of projected revenues and expenditures. The WSCP outlines four stages of action to be undertaken in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions that are applicable to each stage. The City also has a Water Quality Emergency Notification Plan in place to coordinate the City’s response in the event of a catastrophic water supply interruption.

Triggering from one stage to the next is done at the recommendation of the Director of Public Works. Factors to take into consideration include decreases in water allotments from the water supply wholesaler such as CCWD or ECCID, from reductions in infrastructure capacity related to the water treatment plants or pipelines, or climate or state political conditions that would impact the allotment of water supply. Consumption reduction methods outlined in the WSCP include limiting or prohibiting the watering of lawns and other landscape areas, restricting water use at outdoor facilities, restrictions on water use for decorative water features, and prohibiting car washes or laundries which do not use recycled or recirculated water. Rate changes and fees may be implemented to penalize excessive water use or violation of water use ordinances. (City of Brentwood 2015 UWMP)

If an emergency were to occur, requiring the City to implement its WSCP, all of the City’s customers, including those within the Proposed Project, would be subject to the same water conservation measures and water use restrictions as included in City’s WSCP.

7.0 DETERMINATION OF WATER SUPPLY SUFFICIENCY BASED ON THE REQUIREMENTS OF SB 610

Water Code section 10910 states:

10910(c)(4) If the city or county is required to comply with this part pursuant to subdivision (b), the water supply assessment for the project shall include a discussion with regard to whether the total projected water supplies, determined to be available by the city or county for the project during normal, single dry, and multiple dry water years during a 20-year projection, will meet the projected water demand associated with the proposed project, in addition to existing and planned future uses, including agricultural and manufacturing uses.

Pursuant to Water Code section 10910(c)(4), and based on the technical analyses described in this Water Supply Assessment, the City finds that the total projected water supplies determined to be available for the Proposed Project during Normal, Single Dry, and Multiple Dry water years during a 20-year projection will meet the projected water demand associated with the Proposed Project, in addition to existing and planned future uses.

Table 7-1 summarizes the projected availability of the City's existing and planned future potable water supplies and the City's projected water demands in normal, single dry and multiple dry years through 2040. For the purposes of this WSA, the City has chosen to assume no demand reductions during dry years. As shown in Table 7-1, demand within the City's service area is not expected to exceed the City's supplies in any normal year between 2020 and 2040.

As described in this WSA, approximately 119 af/yr of recycled water is needed to meet the landscape irrigation demands at buildout of the Proposed Project. The planned future recycled water supplies shown in Table 6-3 are sufficient to meet these recycled water demands. If recycled water infrastructure is not initially available to deliver recycled water to meet the landscape irrigation demands associated with initial phases of the Proposed Project, surplus potable water supplies may be used in the interim period before recycled water becomes available. As shown in Table 7-1, there will be adequate surplus potable water supply through 2040 to meet the recycled water demands of the project, should a recycled water connection to the project not be constructed.

City of Brentwood: Priority Area 1 Specific Plan
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Table 7-1. Summary of Water Demand Versus Supply During Hydrologic Normal, Single Dry, and Multiple Dry Years^(a,b)

Units: af/yr	2020	2025	2030	2035	2040
Available Potable Water Supply	19,595	19,595	19,595	19,595	19,595
Potable Water Demand (with Proposed Project) ^(c)	12,398	13,384	14,439	15,575	16,796
Potential Potable Water Surplus	7,196	6,211	5,156	4,020	2,799
Available Raw Water Supply	807	807	807	807	807
Raw Water Demand (with Proposed Project) ^(c)	807	807	807	807	807
Potential Raw Water Surplus	0	0	0	0	0
Available Recycled Water Supply ^(d)	7,813	10,419	10,419	10,419	10,419
Recycled Water Demand (with Proposed Project)	632	865	1,096	1,329	1,559
Potential Recycled Water Surplus	7,181	9,553	9,323	9,090	8,860

- (a) Demands are from *City of Brentwood 2015 UWMP*, Table 4-4. Projected water supplies are from Table 6-10 of the same document.
- (b) Projected available water supply and water demands are assumed to be the same for normal, single dry, and multiple dry years.
- (c) Projected raw water and potable water demands are not estimated separately in the City's 2015 UWMP. For this WSA, it was assumed that raw water demands will equal raw water supply, and that the remainder of the potable and raw water demands (as documented in the City's 2015 UWMP) are potable water demands.
- (d) Values for projected recycled water supply are the total safe yield from the City's 2015 UWMP. A revised version of Table 6-9 from the City's 2015 UWMP assumed that the reasonably available volume of recycled water is equal to the projected recycled water demand. In either scenario, the projected recycled water supplies are adequate to meet the demands of the Proposed Project.

8.0 WATER SUPPLY ASSESSMENT APPROVAL PROCESS

10910 (g)(1) Subject to paragraph (2), the governing body of each public water system shall submit the assessment to the city or county not later than 90 days from the date on which the request was received. The governing body of each public water system, or the city or county if either is required to comply with this act pursuant to subdivision (b), shall approve the assessment prepared pursuant to this section at a regular or special meeting.

10911 (b) The city or county shall include the water supply assessment provided pursuant to Section 10910, and any information provided pursuant to subdivision (a), in any environmental document prepared for the project pursuant to Division 13 (commencing with Section 21000) of the Public Resources Code.

The Brentwood City Council must approve this WSA at a regular or special meeting. Furthermore, the City must include this WSA in the Draft Environmental Impact Report (EIR) that is being prepared for the Proposed Project.

In addition, SB 221 applies to residential subdivisions of over 500 dwelling units and requires that the water supplier provide a written verification that the water supply for the project is sufficient, prior to issuance of the final permits. Because the Proposed Project includes up to 2,041 residential dwelling units, it is subject to the requirements of SB 221 (Government Code section 66473.7).

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City of Brentwood: Priority Area 1 Specific Plan

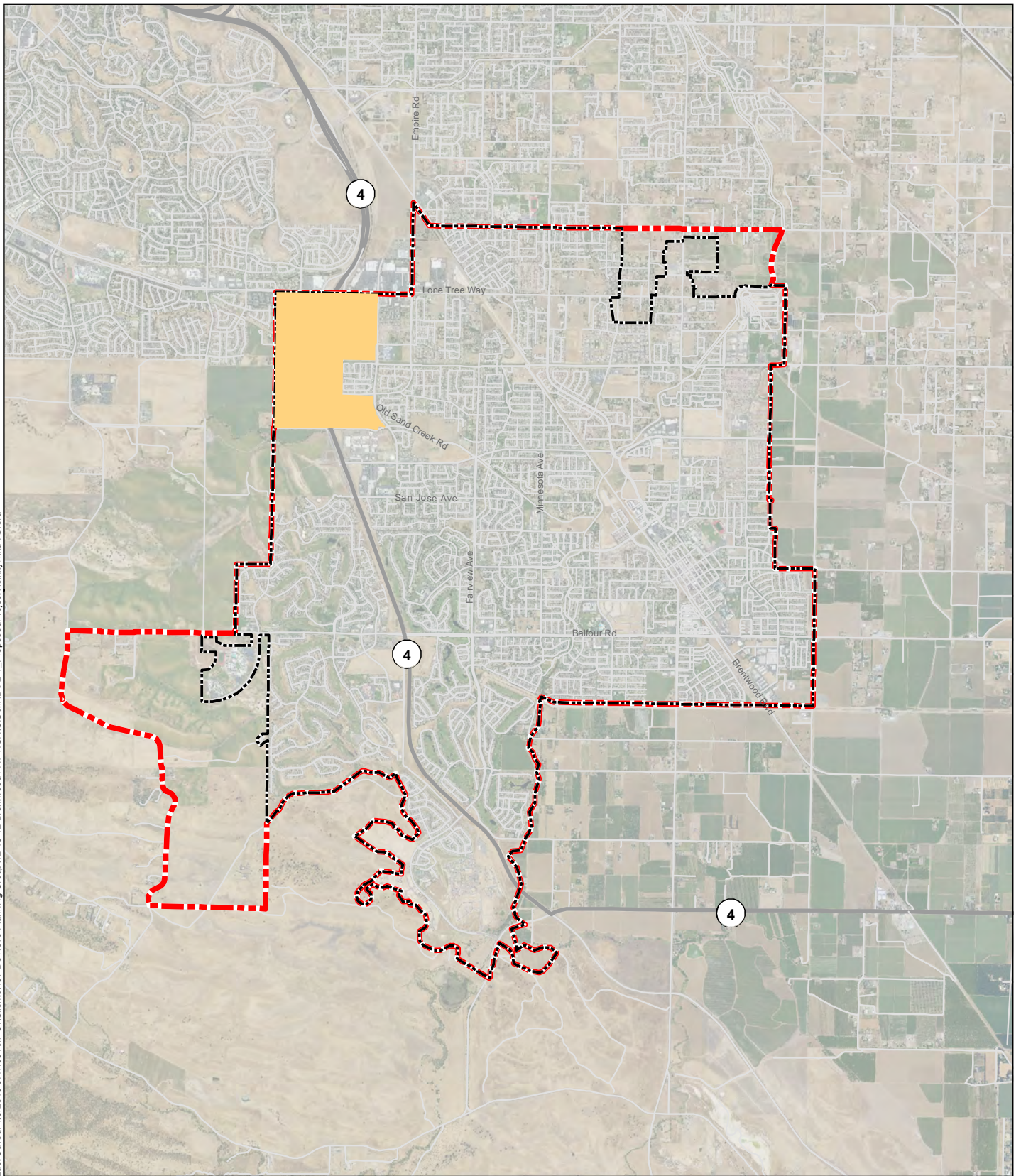
Water Supply Assessment

9.0 REFERENCES




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Symbology

-  Proposed Project Area
-  Brentwood City Limits
-  Brentwood Sphere of Influence

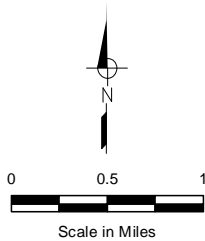
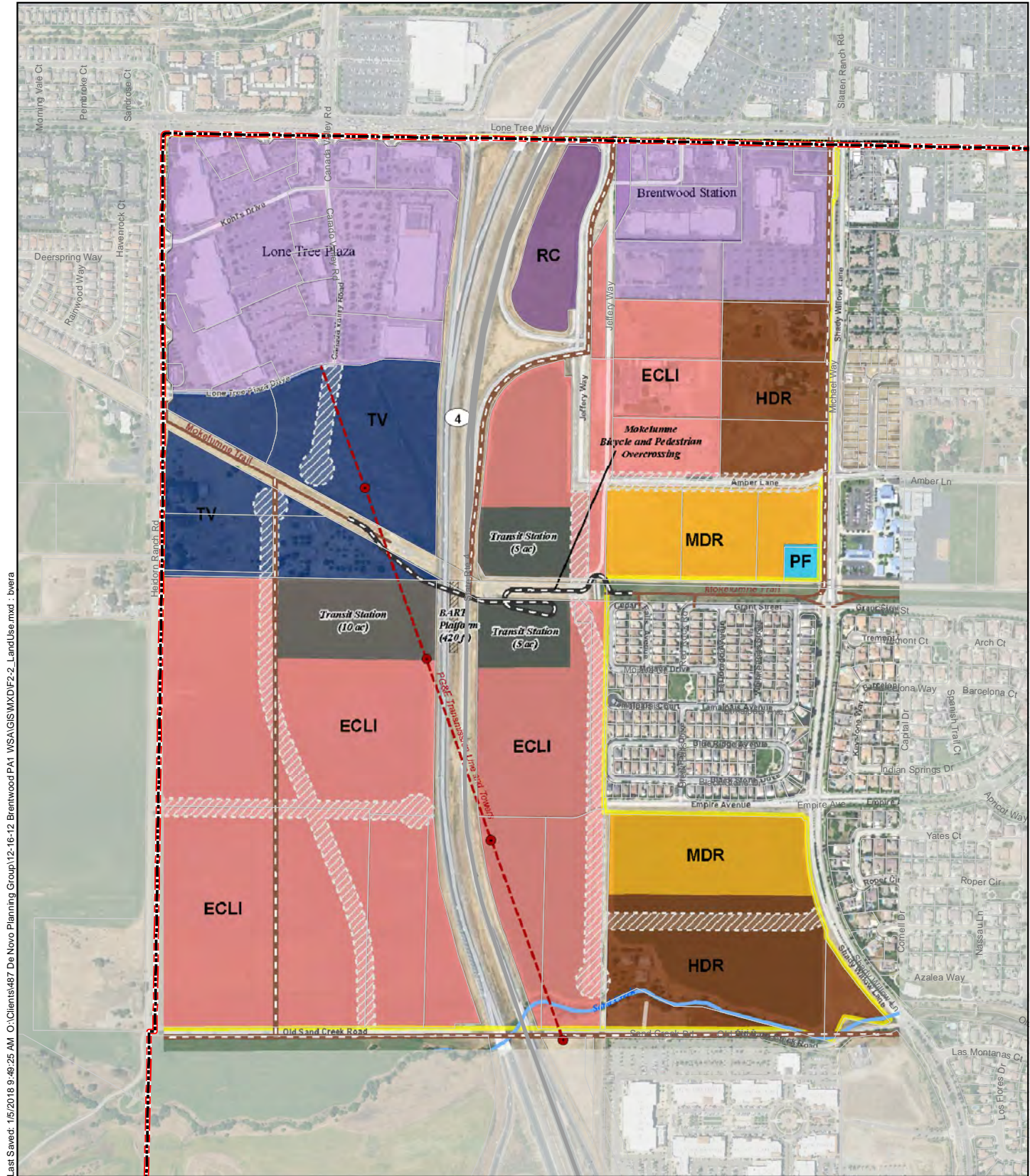


Figure 2-1
Proposed Project Vicinity
De Novo Planning Group
Water Supply Assessment for
Brentwood PA1 Project

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Symbology

- Brentwood City Limits
- Brentwood Sphere of Influence

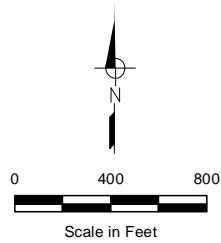


Figure 2-2
Proposed Project
Land Use Plan
 De Novo Planning Group
 Water Supply Assessment for
 Brentwood PA1 Project

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APPENDIX A

Detailed Water Use Calculations

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Table A-1. Potable and Recycled Water Demands for the Priority Area 1 Specific Plan

Development	Land Use Data ^(a)			Total Water Demand				Potable Water Demand ^(b)		Non-Potable Water Demand (Assumed to be recycled water used for Irrigation) ^{(c)(d)}		
	Land Use	Area, acres	Dwelling Units	Water Use Factor ^(e)	units	Average Day, mgd	Annual Total, af/year	Average Day, mgd	Annual Total, af/year	Percent of Area Irrigable, %	Average Day, mgd	Annual Total, af/year
Brentwood Priority Area 1 (PA1) Project	Medium Density Residential (MDR) ^(f)	27	405	450	gpd/DU	0.182	204.2	0.182	204.2			
	High Density Residential (HDR)	40	1,005	275	gpd/DU	0.276	309.6	0.262	293.4	10.0%	0.014	16.2
	Transit Village (TV) - Residential	20	631	275	gpd/DU	0.174	194.4	0.166	186.4	10.0%	0.007	7.9
	Transit Village (TV) - Non-Residential	20		2000	gpd/acre	0.039	44.2	0.032	36.2	10.0%	0.007	7.9
	Regional Commercial (RC)	8		2000	gpd/acre	0.017	18.8	0.014	15.4	10.0%	0.003	3.4
	Employment Center/Light Industrial (ECLI)	154		2000	gpd/acre	0.309	346	0.253	283.6	10.0%	0.055	62.1
	Public Facility (Fire Station)	1		1000	gpd/acre	0.001	1	0.001	0.7	10.0%	0.000	0.4
	Transit Station	20		1000	gpd/acre	0.020	22	0.013	14.4	10.0%	0.007	8.1
	Existing Developed Areas (to remain), Roadways, Utilities and Other Infrastructure ^(g)	83		0			0.000	0	0.000	0		
SUBTOTAL		373	2,041			1.02	1,140	0.92	1,034		0.09	106
	Losses ^(h)			12.5	percent	0.127	143	0.115	129		0.012	13.2
GRAND TOTAL		373	2,041			1.15	1,283	1.04	1,164		0.11	119

(a) From Draft Land Use Plan for Priority Area 1 Specific Plan (De Novo, 2017).
 (b) Potable water demand = total water demand - non-potable water demand.
 (c) Irrigation unit demand of 48.3 in/year/acre is based on City of Brentwood Landscape Project Application (City of Brentwood, 2017).
 (d) Recycled water assumed to be used for irrigation purposes for all proposed land use types, except for MDR land use type.
 (e) Water Use Factors based on the City of Brentwood's Water Master Plan (Ennis Consulting, 2017). Water Use Factors for non-residential uses assumed to be based on gross area. Water Use Factors assumed to include irrigation demand.
 (f) MDR land use type assumed to use potable water for irrigation, and therefore no non-potable demands are projected.
 (g) Does not include State Route 4 right of way.
 (h) Losses are assumed to be 12.5 percent of water use. Based on the City of Brentwood 2015 UWMP (Brown and Caldwell, 2016), Table 4-1.

Table A-2. Projected Unit Irrigation Demand for City of Brentwood^(a)

Month	ET _o ^(b) , in/mo	ETWU (SLA - All Hydrozones) ^(c)	
		gal/acre	ac-ft/acre
January	1.0	27,007	0.08
February	1.5	40,511	0.12
March	2.9	78,321	0.24
April	4.5	121,532	0.37
May	6.1	164,744	0.51
June	7.1	191,751	0.59
July	7.9	213,357	0.65
August	6.7	180,948	0.56
September	5.2	140,437	0.43
October	3.2	86,423	0.27
November	1.4	37,810	0.12
December	0.7	18,905	0.06
Total (in/year)	48.3	1,301,747	4.0

(a) Based on the California Code of Regulations, Title 23 Waters, Division 2 DWR, Chapter 2.7 Model Water Efficient Landscape Ordinance.

(b) Reference ET is based on City of Brentwood Landscape Project Application (Revised 1/1/2017).

(c) MWELo allows SLA areas to use a hydrozone plant factor of 1.0 and not include irrigation efficiency in the ETWU calculation.

Definitions:

LA = Landscape Areas

SLA = Special Landscape Areas (all areas assumed to be irrigated with recycled water).

ET = Evapotranspiration

ET_o = Reference ET

ETWU = Estimated Total Water Use

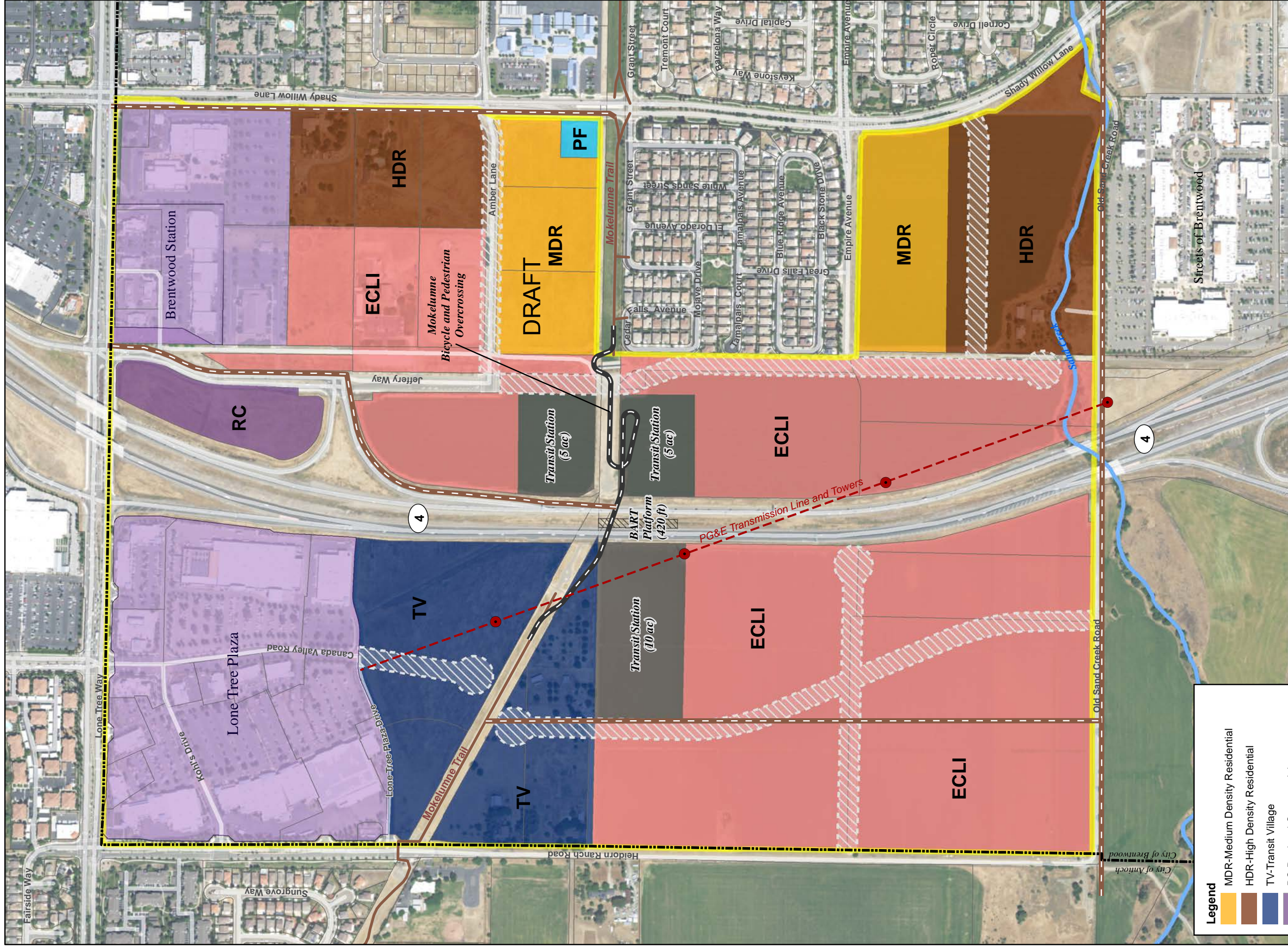
ETWU = ET_o x 0.62 x ETcoeff x {(LA x PF)/Irr Eff.}+SLA}

PF = Plant Factor based on Hydrozone Area

APPENDIX B

Priority Area 1 Specific Plan Draft Land Use Map

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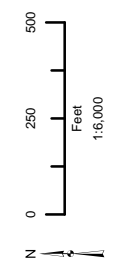


Legend

- MDR-Medium Density Residential
- HDR-High Density Residential
- TV-Transit Village
- RC-Regional Commercial
- ECLI-Employment Center/Light Industrial
- PF-Public Facility (Fire Station)
- Transit Station
- Developed Areas
- New Primary Roadway Network
- New Trail Alignments

Land Use	Acres
ECLI	154.33
HDR	40.19
MDR	27.02
PF	0.99
RC	8.40
TV	39.44
Transit Station	20.00
Total	290.37

PRIORITY AREA 1 SPECIFIC PLAN
Draft Land Use Map



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