CITY OF REDLANDS
RHNA REZONE

WATER SUPPLY ASSESSMENT

CITY OF REDLANDS
SAN BERNARDINO COUNTY, CALIFORNIA

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1. WSA Purpose and Background

This Water Supply Assessment (WSA) was prepared for EPD Solutions and the City of Redlands ("City" or "Redlands") as the lead agency under the California Environmental Quality Act (CEQA), by Fuscoe Engineering, Inc. (Fuscoe), as the consultant, regarding the Redlands RHNA Rezone Project ("Redlands RHNA Rezone" or "Project"). This study is a requirement of California law, specifically Senate Bill 610 (referred to as SB 610). SB 610 is an act that amended Section 21151.9 of the Public Resources Code and Sections 10631, 10656, 10910, 10911, 10912, and 10915 of the Water Code. SB 610 repealed Section 10913 and added and repealed Section 10657 of the Water Code. SB 610 was approved by the Governor and filed with the Secretary of State on October 9, 2001, and became effective January 1, 2002.

Under SB 610, WSAs must be furnished to local governments for inclusion in environmental documentation for certain projects (as defined in Water Code 10912 [a]) subject to CEQA. Due to increased population, land use changes and water demands, this water bill seeks to improve the link between information on water availability and certain land use decisions made by cities and counties. SB 610 takes a significant step toward managing the demand of California's water supply as it provides regulations and incentives to preserve and protect future water needs. The intent of this bill is to coordinate local water supply and land use decisions to help provide California's cities, farms, and industrial developments with adequate water supplies.

With the introduction of SB 610, any project under CEQA shall provide a WSA if the project meets the definition of the Water Code Section 10912. "Project" means any of the following:

- A proposed residential development of more than 500 dwelling units.
- A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.
- A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.
- A proposed hotel or motel, or both, having more than 500 rooms.
- 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.
- A mixed-use project that includes one or more of the projects specified in this subdivision.
- 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.
- If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections.

After review of Water Code Section 10912, the Redlands RHNA Rezone Project is deemed a "Project" because it proposes the rezoning throughout the City of Redlands that would result in the development of more than 500 dwelling units.

In addition, it is also necessary to include the passing (September 24, 2016) of Senate Bill 1262 (Chapter 594) which acts to amend Section 66473.7 of the Government Code, and to amend

Section 10910 of the Water Code, relating to land use[1] and the Sustainable Groundwater Management Act (SGMA) that was passed by California's Governor on September 16, 2014. Pursuant to SB 1262, as of January 1, 2017, WSAs are now required to include certain SGMA-related information if water supply for a proposed project includes groundwater. Specifically, if a water supply for a proposed project includes groundwater, the following additional information shall be included in the water supply assessment:

- 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 a basin that has not been adjudicated that is a basin designated as high- or medium-priority pursuant to Section 10722.4, information regarding the following:
    - Whether the department has identified the basin as being subject to critical conditions of overdraft pursuant to Section 12924.
    - If a groundwater sustainability agency has adopted a groundwater sustainability plan or has an approved alternative, a copy of that alternative or plan.
- For a basin that has not been adjudicated that is a basin designated as low- or very low priority pursuant to Section 10722.4, 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 0characterizes 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.

As described in more detail throughout this WSA, the proposed Project will utilize local groundwater from the Upper Santa Ana Valley – San Bernardino Basin (SBB), Yucaipa Basin, and surface water supplies from Mill Creek and the Santa Ana River (SAR). Therefore, additional information regarding groundwater supply and management will be included in this WSA to satisfy the requirements of SB 1262.

1.1 SCOPE OF WORK

The City of Redlands, situated at the base of the San Bernardino Mountains in San Bernardino County, is approximately 60 miles east of Los Angeles and 45 miles west of Palm Springs. It lies along the Interstate 10 (I-10) corridor, connecting it to cities like San Bernardino, Fontana, Ontario, and Los Angeles to the west, and Yucaipa, Beaumont, and Coachella Valley to the east. State Route 210 (SR-210) begins in the City and moves northwest, reaching Highland and Pasadena. The proposed Housing Element Regional Housing Needs Allocation (RHNA) encompasses 196 housing sites and site 24 needs a zone change to align with existing school use and surrounding future residential. The sites are divided into two areas: Sites 1 through 16A and 24, located in the western part of the city within the East Valley Corridor Specific Plan (EVCSP), and Sites 17 through 23, situated northeast of the first group and near SR-210, just

[1] Senate Bill No. 1262, CHAPTER 594, found here: http://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB1262

south of East San Bernardino Boulevard in North Redlands, close to I-10 and Downtown Redlands. These rezone sites are part of the Housing Element Sites Inventory, which is crucial for meeting housing targets within the City.

See Figure 1 for an aerial extent of the Redlands RHNA Rezone area.

Basemap Aerial (World Imagery)

City of Redlands RHNA Rezone Aerial Extent

Figure 1

Redlands, CA

6/24/2024

FUSCOE ENGINEERING
FULL CIRCLE THINKING

Project Parcels
City Boundary

N

1 inch = 5,000 feet

0 5,000 10,000 Feet

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1.2 LAND USE DESCRIPTION

Under the City's existing General Plan Update (GPU), which was certified in July 2017, the report provided a long-term policy and plan of action for the City through the year 2035. Under the 2017 GPU the City projected that the areas being considered for rezoning would initially encompass 116.2 acres of land with a mix of 111, Medium Density Residential (MDR) and High Density Residential (HDR) residential dwelling units (DUs), in addition to approximately 2.2 million non-residential Commercial/Industrial and Commercial/Admin Professional square feet (SF).

See Figure 2 and Table 1 below for a breakdown of the City's existing zoning designations within the proposed RHNA Rezone areas.

Table 1 - Existing General Plan Buildout

Plot Number	Acres	General Plan Land Use Designation	Zoning	Residential Buildout Capacity (DU)	Non-Residential Buildout Capacity (SF)
1	8.91	Commercial/ Industrial	EV/IC		194,060
2	4.26	Commercial/Industrial	EV/IC		92,783
3	5.84	Commercial/Industrial	EV/IC		127,195
4	3.15	Commercial/Industrial	EV/IC		68,607
5	1.07	Commercial/Industrial	EV/IC		23,305
6	1.9	Commercial/Industrial	EV/IC		41,382
7	1.9	Commercial/Industrial	EV/IC		41,382
8	4.07	MDR	EV3000RM	40	
9	2.5	Commercial/Industrial	EV/IC		54,450
10	4.03	Commercial/Industrial	EV/IC		87,773
10A	0.08	Commercial/Industrial	EV/IC		1,742
11	4.70	Commercial/Industrial	EV/IC		102,366
12	2.31	Commercial/Industrial	EV/IC		50,312
13	4.70	Commercial/Industrial	EV/IC		103,019
14	4.21	Commercial/Industrial	EV/IC		91,694
15	8.86	Commercial/Industrial	EV/IC		192,971
15A	0.02	Commercial/Industrial	EV/IC		436
16	10.7	Commercial/Industrial	EV/IC		231,957
16A	0.01	Commercial/Industrial	EV/IC		218
17	14.05	Commercial/Admin Professional	CP-4		306,009
18	5	Commercial/Admin Professional	CP-4		108,900
19	6.31	Commercial/Admin Professional	CP-4		137,432
20	4.76	MDR	A-1	1	
21	1.64	MDR	R-1	9	
22	0.33	HDR	R-2	4	
23	3.96	HDR	R-2	57	

Plot Number	Acres	General Plan Land Use Designation	Zoning	Residential Buildout Capacity (DU)	Non-Residential Buildout Capacity (SF)
24	6.94	Commercial/Industrial	EV/IC		151,048
Total	**116**			**111**	**2,209,040**

Source: City of Redlands RHNA Rezone, Project Description "Table 3-1 Existing General Plan Buildout"

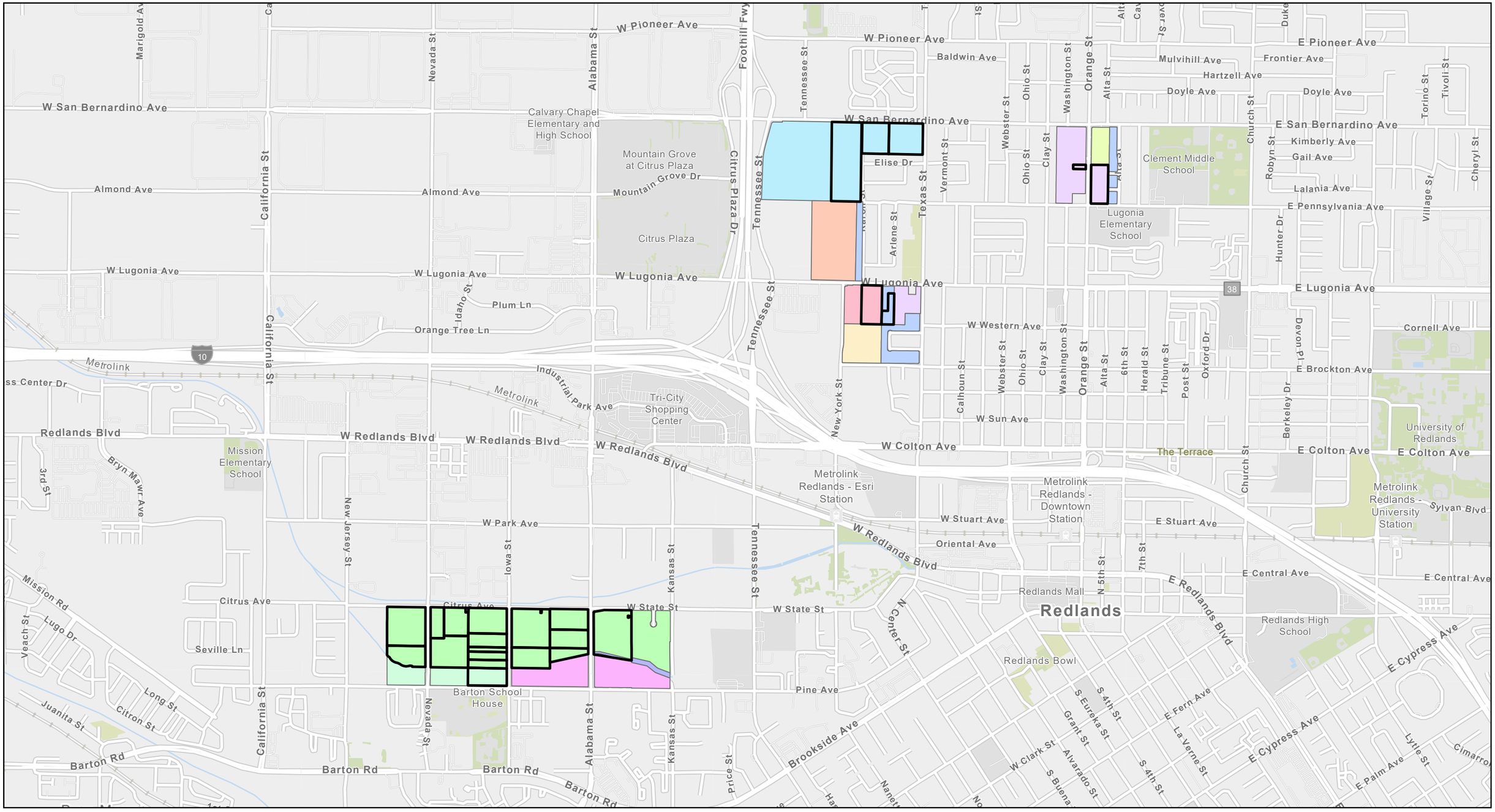
LAND USE AND HOUSING ELEMENT

The City of Redlands 2021-2029 Housing Element outlines how the City plans to meet its housing needs as mandated by the California Department of Housing and Community Development (HCD) through the Regional Housing Needs Assessment (RHNA). The Southern California Association of Governments (SCAG), the regional planning agency for Southern California, assigned the City a target of 3,516 new housing units to be incorporated by 2029. To comply with this RHNA assignment, the City prepared a Housing Element covering the period from October 15, 2021, to October 15, 2029. This plan was adopted on February 1, 2022, and includes measures to increase residential zoning capacity and promote various housing types and affordability levels. Thus, the Housing Element identified 196 sites suitable for new housing, with 23 requiring rezoning to support medium and high-density residential developments.

PROPOSED GENERAL PLAN AMENDMENT

As a result of the land use and housing element the City of Redlands is proposing a General Plan Amendment (GPA) to change the land use designations of multiples sites from Commercial/Industrial or Commercial/Administrative Professional to Medium Density Residential or High Density Residential. The 24 sites identified within the land use and housing element have a capacity for up to 2,436 housing units and 151,048 square feet of Public/Institutional space, with development anticipated through 2035. Although, no specific development project is currently proposed this report will address and analyze the impacts of developing the maximum buildout under the new rezoning standards.

See Table 2 below for a specific breakdown of the City's proposed rezone sites and maximum buildout plans under the GPA.



City of Redlands RHNA Rezone Existing Land Use Zoning

Figure 2

Redlands, CA

6/24/2024

FUSCOE ENGINEERING
FULL CIRCLE THINKING

Project Parcels

Zoning
- Agricultural (A-1)
- Commercial/Industrial (EV/IC)
- Commercial/Admin Professional (CP-4)
- Flood Plain (FP)
- Light Industrial (M-1)
- Medium Density Residential (R-1)
- Medium Density Residential (EV2500RM)
- Medium Density Residential (EV3000RM)
- High Density Residential (R-2)
- High Density Residential (R-3)
- Commercial (C-2)

N

1 inch = 1,500 feet

0 1,500 3,000 Feet

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Table 2 - Proposed General Plan Buildout

Site Number	Proposed Land Use Designation	Proposed Zoning	Proposed Density (DU/acre)	Acres	Proposed Maximum Buildout	
1	MDR	R-2	15	8.91	133	DU
2	MDR	R-2	15	4.26	63	DU
3	HDR	R-3	30	5.84	175	DU
4	HDR	R-3	30	3.15	94	DU
5	HDR	R-3	30	1.07	32	DU
6	HDR	R-3	30	1.9	57	DU
7	HDR	R-3	30	1.9	57	DU
8	MDR	EV2500RM	15	4.07	61	DU
9	HDR	R-3	30	2.5	75	DU
10	HDR	R-3	30	4.03	120	DU
10A	MDR	R-3	30	0.08	2	DU
11	MDR	R-2	15	4.7	70	DU
12	MDR	R-2	15	2.31	34	DU
13	HDR	R-3	30	4.73	141	DU
14	HDR	R-3	30	4.21	126	DU
15	HDR	R-3	30	8.86	265	DU
15A	HDR	R-3	30	0.02	1	DU
16	MDR	R-2	15	10.7	159	DU
16A	MDR	R-2	15	0.01	-	DU
17	MDR	R-2	15	14.1	210	DU
18	HDR	R-3	30	5	150	DU
19	HDR	R-3	30	6.31	189	DU
20	MDR	R-2	15	4.76	71	DU
21	MDR	R-2	15	1.64	24	DU
22	HDR	R-3	30	0.33	9	DU
23	HDR	R-3	30	3.96	118	DU
24	Public/Institutional (PI)	EV/IP	0.5 Floor Area Ratio (FAR)	6.94	**151,048**	**SF**
Total				**116**	**2,436**	**DUs**

Source: City of Redlands RHNA Rezone, Project Description "Table 3-2: Proposed General Plan Buildout"

As shown in the table above, the GPA would propose a zone change for all sites to enable medium and high-density residential development, with the exception of Site 24 which would change to Public/ Institutional uses.

To see a summary of the City's approved general plan buildout to the proposed GPA buildout see Table 3 below.

Table 3 - Comparison of Existing General Plan Buildout to Proposed General Plan Buildout

Land Use	Unit	Sites 1-16A		Sites 17-24		GP Total	Proposed Total	Proposed Project minus Approved GP
		Approved GP	Proposed Project	Approved GP	Proposed Project			
Commercial/ Institutional	SF	1,505,651	-	151,048	-	1,656,700	-	(1,656,700)
Commercial	SF	-	-	552,341	-	552,341	-	(552,341)
Public/ Institutional	SF	-	-	-	151,048	-	151,048	151,048
MDR	DU	40	522	10	305	50	825	777
HDR	DU	-	1,143	61	466	61	1,611	1,548
Total Residential	**DU**	**40**	**1,665**	**71**	**771**	**111**	**2,436**	**2,325**
Total Nonresidential	**SF**	**1,505,651**	**-**	**703,389**	**151,048**	**2,209,041**	**151,048**	**(2,057,992)**

Source: City of Redlands RHNA Rezone, Project Description "Table 3 3: Comparison of Approved General Plan Buildout to Proposed Project"

As shown above, the proposed project aims to convert approximately 2,057,992 SF of planned nonresidential land uses to residential land uses to accommodate up to 2,436 housing units.

2. WATER

2.1 WATER SYSTEM ENVIRONMENTAL SETTING & INFRASTRUCTURE

The City's water system infrastructure is divided into three main categories: Non-Potable Water (NPW), Potable Water (PW), and Recycled Water (RW). Each system is designed to serve specific demands and utilizes different water sources and treatment processes to ensure safe and reliable water delivery.

POTABLE WATER SYSTEM (PW)

Water Treatment Plants (WTPs): The City operates two major water treatment plants, the Tate WTP and the Hinckley WTP. These facilities treat surface water and groundwater to meet drinking water standards. The Tate WTP has a capacity of 14 million gallons per day (MGD), while the Hinckley WTP has a capacity of 12 MGD. The primary processes provided at the WTPs include coagulation, flocculation, sedimentation, filtration, and disinfection.

Distribution Network: The City's potable water distribution system includes a network of approximately 466 miles of pipelines ranging from 6 to 60 inches in diameter, 13 storage reservoirs with a total capacity of 51.6 million gallons, and 12 booster stations. This distribution network ensures the delivery of treated water to residential, commercial, and institutional users throughout the City. Infrastructure throughout the City is strategically placed to maintain the water systems pressure and storage capacity.

NON-POTABLE WATER SYSTEM (NPW)

Distribution Network: The non-potable water system primarily supplies water for irrigation and industrial uses. NPW is sourced from untreated groundwater and surface water. The NPW system includes separate pipelines and storage facilities that deliver water to parks, golf courses, and large landscaped areas. Specifically, infrastructure for NPW specifically includes

15 miles of pipelines ranging in size from 4 to 36 inches in diameter, and storage tanks with a total capacity of 7.5 million gallons, which are separate from the potable water system to prevent cross-contamination. This system is essential for the City in its efforts to conserve potable water by using NPW water where appropriate.

RECYCLED WATER SYSTEM (RW)

Treatment Process: Recycled water is produced from treated wastewater at the City's wastewater treatment plant, which has a capacity of 9.5 MGD. This water undergoes advanced treatment processes, including secondary and tertiary treatment, to remove contaminants and meet regulatory standards for non-potable reuse.

Distribution Network: Specifically, the recycled water system includes 30 miles of pipelines ranging in diameter of 4 to 24 inches, and the system distributes treated effluent for landscape irrigation, industrial cooling, and other non-potable applications. This system helps reduces City's potable water demands and promotes sustainable water use.

PRESSURE ZONES

The City's water distribution system is divided into multiple pressure zones to ensure the consistent delivery of water across its varying elevations and demand areas. These zones are designed to maintain adequate water pressure for all demands, prevent excessive pressure that could damage infrastructure, and optimize the operational efficiency of the water system. Each pressure zone is managed through a network of booster stations, reservoirs, and pressure-reducing valves (PRVs) that regulate and stabilize water pressure. The PRVs system provides real-time data allowing for operation adjustments in response to demand changes, which helps stabilize the distribution network.

PRESSURE ZONE 1570 – RHNA REZONE AREA

All RHNA Rezone areas within the City are located within Pressure Zone 1570, which is equipped with a range of infrastructure designed to manage water distribution effectively at higher elevations. This zone includes a reservoir known as the 1570 Zone Reservoir, which has a capacity of approximately 2.5 million gallons. This reservoir helps to store and regulate water pressure and ensure efficient distribution within the RHNA Rezone areas.

To support the elevation needs of Zone 1570, the area is serviced by a primary booster station, that is equipped with multiple pumps with speed controls, allowing for adjustments in flow rates and maintaining consistent pressures. The function of this booster station is crucial as it "lifts" water from lower elevation zones up to the 1570 Zone, which ensures a steady and reliable water supply throughout the City.

The pipeline network within Pressure Zone 1570 includes pipelines of various sizes, designed to handle the increased pressure required for higher elevations. The primary pipelines in the RHNA Rezone Areas range from 12 inches to 24 inches in diameter. These larger diameter pipelines are necessary for maintaining adequate flow rates, velocities, and pressures to support both residential and commercial water needs.

Managing water pressure in Zone 1570 involves addressing challenges such as potential pressure fluctuations due to changes in demand and elevation variations. However, the use of advanced monitoring and control systems, such as the pressure-reducing valves (PRVs), helps to mitigate these issues by providing real-time data on pressure levels and allowing for rapid

adjustments. See Figure 3 for a view of the water system facilities within the RHNA Rezone area and Figure 4 for a view of the City's pressure zones.

City of Redlands RHNA Rezone Existing Water System Facilities

Figure 3

Redlands, CA

7/1/2024

FUSCOE ENGINEERING
FULL CIRCLE THINKING

Project Parcels
Recycle Water Line

Water Mains
- < 9"
- 9" to 12"
- 12" to 18"
- 18" to 30"

N

1 inch = 2,000 feet

0 2,000 4,000 Feet

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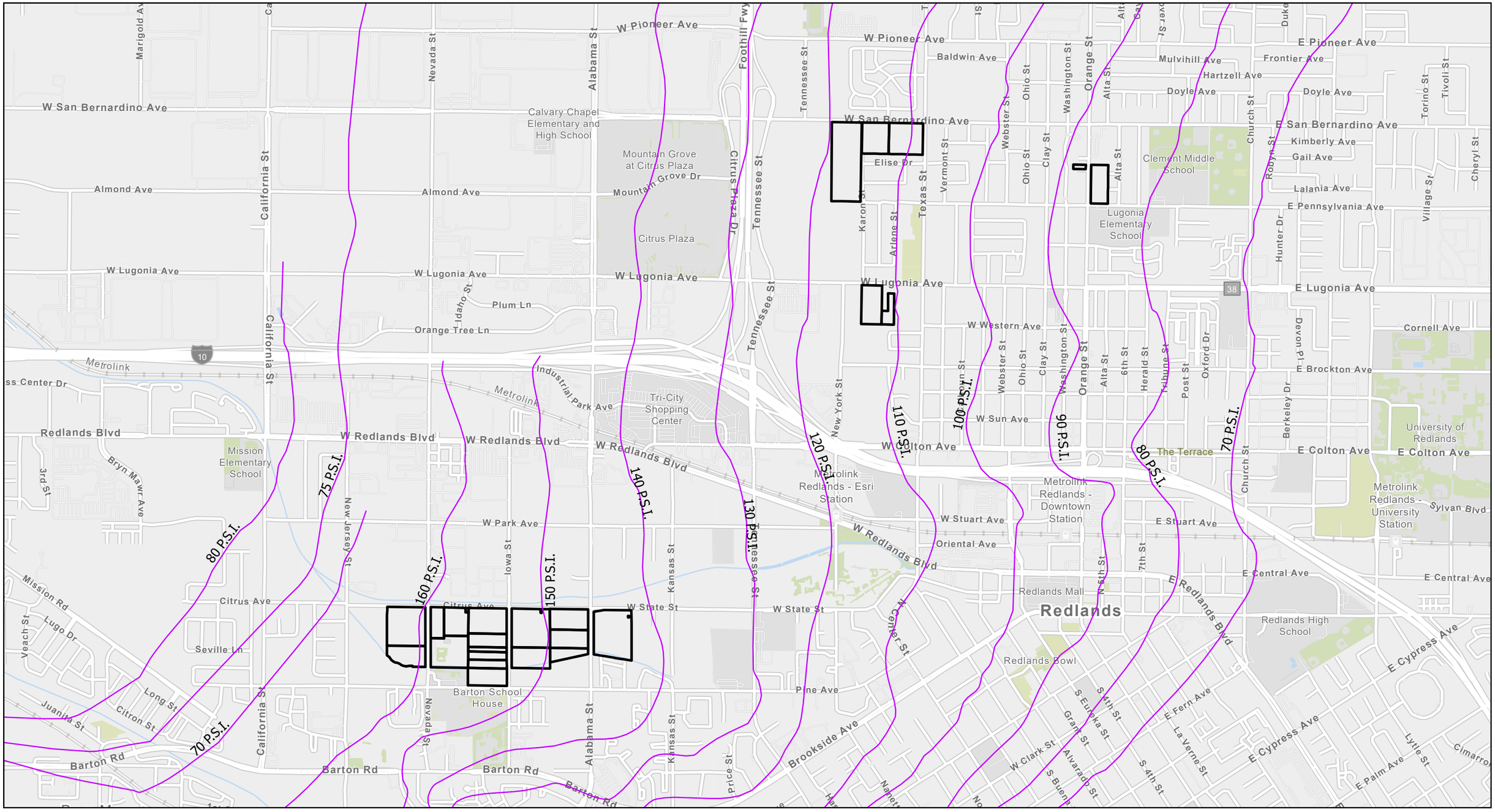

City of Redlands RHNA Rezone Water System Pressure Zones

Figure 4

Redlands, CA

6/24/2024

FUSCOE ENGINEERING
FULL CIRCLE THINKING

Pressure Lines

- 100 P.S.I.
- 110 P.S.I.
- 120 P.S.I.
- 130 P.S.I.
- 140 P.S.I.
- 150 P.S.I.
- 160 P.S.I.
- 70 P.S.I.
- 75 P.S.I.
- 80 P.S.I.
- 90 P.S.I.
- Project Parcels

N

1 inch = 1,500 feet

0 1,500 3,000 Feet

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2.2 EXISTING WATER DEMANDS

The City categorizes its water demands into six categories for potable deliveries: Single Family, Multi-Family, Commercial/Institutional, Landscape, Agricultural Irrigation, and Other, which includes fire suppression, construction water, and bulk water sales. Redlands also makes deliveries of non-potable water to three customer categories: Commercial/Institutional, Landscape, and Agricultural/Landscape Irrigation, and delivers recycled water to Mountain View Power Plant and the City-owned landfill from the City of Redlands Wastewater Treatment Plant (WWTP). Recycled water that is not discharged or used by those two customers is mixed with non-potable water from wells and is delivered to customers served by the City's non-potable system. This water is billed as "raw water" in the City's billing system. Bear Valley Mutual Water Company delivers wholesale raw water to Redlands and Redlands delivers non-potable water to Bear Valley Mutual Water Company through multiple agreements. Additionally, Redlands delivers wholesale potable water to Rocky Comfort Mutual Water Company. Table 4 provides the volume of water (AF) for each land use category covering 2016-2020. The number of active connections in each category from 2016 to 2020 are shown in Table 4.

Table 4 – City of Redlands 2016-2020 Water Demands (AF)

Land Use Type	2016	2017	2018	2019	2020
Single Family	19,515	19,526	19,532	19,473	19,922
Multi-Family	966	962	961	952	980
Commercial / Institutional	1,357	1,357	1,353	1,363	1,397
Landscape	527	521	525	528	533
Agricultural Irrigation	34	35	30	32	17
Other	633	650	658	672	696
Commercial / Institutional - Raw	8	9	10	10	11
Landscape - Raw	111	121	124	124	135
Agricultural Irrigation - Raw	13	9	10	5	3
Total Potable and Raw	***23,164***	***23,190***	***23,203***	***23,159***	***23,694***
Recycled Water	2	2	2	2	2
Total	**23,166**	**23,192**	**23,205**	**23,161**	**23,696**

Source: 2020 City of Redlands IRUWMP (Part 2, Chapter 4)

Southern California's urban water demand has reduced significantly on a per-capita basis largely due to the mandates from the Water Conservation Act, and 2014 and 2015 water reduction proclamations. These laws required all of California's retail urban water suppliers serving more than 3,000 acre-feet per year (AFY) or 3,000 service connections to achieve between 20 and 35 percent per-capita reduction from 2013 water consumption levels. Redlands has participated in the San Bernardino Valley Municipal Water District (SBVMWD) water use reduction programs through the former California Urban Water Conservation Council (CUWCC) and is continuing those efforts through the State Water Board. Redlands met their target goals and is in good standing for maintaining eligibility for State programs that offer grants and loans for critical water projects.

Water demand within the Redlands service area is dependent on many factors such as local climate conditions and the evolving hydrology of the region. Demographics and land use characteristics are also key factors affecting the City's water demands. In addition to local

factors, the watersheds of California's imported water supply continue to experience drought conditions which may continue to be a significant impact on future water supplies. The potential effects of global climate change are a factor and concern for water managers and planners for California's future water supplies. To confirm water supplies can meet demands, demands are tracked by assessing demographics, conservative practices and projecting demands into the future as described in more detail below.

SBX7-7 BASELINE AND TARGETS

The Water Conservation Act of 2009 required the State of California to reduce urban per capita water use by 20 percent by 2020. Each water agency was required to establish per-capita water use targets for 2015 and 2020. The City's baseline and 2020 target were calculated in the 2015 Regional Urban Water Management Plan and was not changed for the 2020 plan. The City's calculated water use target for 2020 is 285 gallons per capita per day (GPCD). Through the implementation of its active water conservation program, Redlands met this target as shown in Table 5. To maintain this level of water use, Redlands intends to continue its current level of outreach and water use efficiency programs for the foreseeable future. See Table 5 below of which summarizes the City's water use target in GPCD.

Table 5 - SBX 7-7 2020 Compliance

2020 Water Use Target GPCD	Actual 2020 GPCD	Supplier Achieved Target Reduction for 2020?
285	279	Yes
Notes: Source: Table 4-7, City of Redlands chapter of the IRUWMP (July 2021).		

2.3 PROPOSED WATER DEMANDS

REGIONAL – CITY OF REDLANDS

Within the UWMP, the demand factors for each customer class were based on connection and demand data from the calendar year 2020, which was reviewed against demand factors from other years and determined to be a reasonable representation of average demands. The number of future new connections for each customer category was estimated for each 5-year period through 2045 based on the projected SCAG population growth rate for years 2020-2035 and 2035-2045.

To estimate future water, use for each customer category in the UWMP, the demand factor is multiplied by the number of estimated new connections and added to the 2020 demands from existing customers in each category. This process is applied to each customer type for a breakdown of the estimated future water use. Redlands anticipates that future commercial/institutional connections will be dual-plumbed with both a potable service for indoor demands and non-potable service for outdoor demands. Both potable and raw commercial/institutional demands were adjusted to reflect this. Additionally, recycled water demand at the Mountain View Power Plant and landfill were assumed to be equal to their average annual consumption from 2016 to 2020. Projected water demands by customer class are summarized in Table 6 is taken from the Redlands 2020 UWMP.

Table 6 - Redlands Projected Water Demands (AFY)

Land Use Type	2025	2030	2035	2040	2045
Single Family	12,943	13,470	13,997	14,461	14,925
Multi-Family	3,036	3,160	3,284	3,393	3,501
Commercial / Institutional	3,081	3,145	3,209	3,265	3,321
Landscape	2,292	2,385	2,478	2,560	2,643
Agricultural Irrigation	206	206	206	206	206
Other	206	214	223	230	238
Commercial / Institutional - Raw	248	319	391	454	517
Landscape - Raw	1,451	1,510	1,569	1,621	1,673
Agricultural Irrigation - Raw	9	9	9	9	9
Water Losses	2,347	2,442	2,537	2,620	2,703
Subtotal Potable and Raw	***25,819***	***26,860***	***27,903***	***28,819***	***29,736***
Recycled Water Demand	1,173	1,173	1,173	1,173	1,173
Total	**26,992**	**28,033**	**29,076**	**29,992**	**30,909**

Source: Table 4-5 and 4-6, City of Redlands chapter of the IRUWMP (July 2021).

The City's demand is projected to increase about 13% from 2020 to 2045. Redlands can produce additional groundwater to meet increases in demand in dry years. These water supply and demand projections can be utilized to confirm there is adequate supply to satisfy the City's water demands, in addition to the proposed Project now and into the future. This is described in more detail below.

LOCAL – THE RHNA REZONE AREA

As described previously, the City is proposing a GPA and zone change to rezone 23 different sites from commercial/industrial sites to residential and public/institutional uses. Doing so will allow the City to meet its RHNA requirements, as the rezoned areas will accommodate up 2,436 residential DUs and 151,048 non-residential SF, in comparison to the existing 2017 GPU. The following tables will present a detailed analysis of the City's water use factors and water demands for various land use designations under the existing GPU and proposed GPA project. These factors are necessary to understand how current water demands will be altered when projecting future water needs under the RHNA Rezone/ GPA project.

Water Use Factors: The water use factors used to estimate the City's existing and proposed water demands are normally based on the City-wide 2022 Water Systems Master Plan (WSMP), which expresses demand in acre-feet per year per acre (AFY/Acre) for different land uses. These factors were developed through an analysis of historical water usage data across various land use categories, including residential, commercial, industrial, and agricultural sectors. The water use factor in the 2022 WSMP lumps all multi-family residential into one category and does not differentiate between medium density and high-density land uses. Therefore, an alternative approach was utilized to estimate water demands for different multi-family densities. The RHNA Rezone project allows for a density of 15 to 30 dwelling units per acre. Thus, the alternative method applied relies on sewage flow factors from the City-wide 2021 Wastewater Master Plan (WWMP), which uses unit flow factors, gallons per day per dwelling unit (GPD/DU) adjusted for the proposed high and medium residential densities. This method,

as outlined in the WWMP, accounts for distinct water usage patterns associated with various residential densities, providing a more accurate reflection of projected water demands. For each sewer flow factor, a 20% increase has been applied to derive a water use factor for each land use category. For consistency purposes, the sewer flow rate for commercial has also been used from the WWMP with a 20% multiplier to account for water demands. The City's thorough approach ensures that the water use factors as shown in Table 7 below represent actual usage patterns, support sustainable water management, and inform decision-making for land use planning throughout the City.

Table 7 – City of Redlands WSMP Water Use Factors

Land Use Designation	Unit Flow Factor		Density	
High Density Residential	144	GPD/ DU	30	DU/ Acre
Medium Density Residential	198	GPD/ DU	15	DU/ Acre
Commercial	3,600	GPD/ Acre		

Source: 2021 Wastewater Master Plan - Table 3.2: Unit Sewage Flow Factors

Note: The sewer generation values from the 2021 WWMP are increased by 20% to estimate the water generation factors. This adjustment assumes a sewer-to-water return ratio of 0.8.

See Table 8 below for an estimate of existing water demands from the RHNA Rezone areas.

Table 8 – Redlands RHNA Rezone Existing Water Demands

Existing Land Use Designation	Maximum Buildout		Existing Water Use Factor		Existing Water Use (GPD)		Existing Water Use (AFY)	
High Density Residential	61	DU	144	GPD/ DU	8,784		10	
Medium Density Residential	50	DU	198	GPD/ DU	9,900	GPD	11	AFY
Non-Residential	2,209,041	SF	3,600	GPD/ Acre	182,565		204	
				TOTAL	**201,249**	**GPD**	**225**	**AFY**

Source: 2021 Wastewater Master Plan - Table 3.2: Unit Sewage Flow Factors

* The sewer generation values from the 2021 WWMP are increased by 20% to estimate the water generation factors. This adjustment assumes a sewer-to-water return ratio of 0.8. Some numbers may not sum precisely due to rounding.

As shown in the table above it is estimated that the existing land uses within the RHNA Rezone Areas require approximately 225 AFY or 201,249 GPD of water.

See Table 9 below for an estimate of proposed water demands from the RHNA Rezone areas.

Table 9 – Redlands RHNA Rezone Proposed Water Demands

Proposed Land Use Designation	Maximum Buildout		Proposed Water Use Factor		Proposed Water Use (GPD)		Proposed Water Use (AFY)	
High Density Residential	1,611	DU	144	GPD/ DU	231,984	GPD	260	AFY
Medium Density Residential	825	DU	198	GPD/ DU	163,350	GPD	183	AFY
Public/Institutional (PI)	151,048	SF	3,600	GPD/ Acre	12,483	GPD	14	AFY
TOTAL					**407,817**	**GPD**	**457**	**AFY**

Source: 2021 Wastewater Master Plan - Table 3.2: Unit Sewage Flow Factors

* The sewer generation values from the 2021 WWMP are increased by 20% to estimate the water generation factors. This adjustment assumes a sewer-to-water return ratio of 0.8. Some numbers may not sum precisely due to rounding.

As shown in the table above the RHNA Rezone will potentially increase the number of residential units from 111 DUs to 2,436 DUs and will reduce the nonresidential SF from 2,209,041 SF to 151,048 SF. This large change in land use from commercial /industrial to medium and high density residential and public/institutional uses has the potential to generate demands of up to 457 AFY or 407,817 GPD.

The difference between the water demands calculated in Table 8 and Table 9 are representative of the net change in demands for the City's RHNA Rezone areas. See Table 10 below for more details.

Table 10 – Redlands RHNA Rezone Net Change in Water Demands

Net Change (Proposed - Existing GPU) Water Demands				
Proposed Demand	407,817	GPD	457	AFY
Existing Demand	201,249	GPD	225	AFY
Net Change	**206,568**	**GPD**	**231**	**AFY**

* Note some numbers may not sum precisely due to rounding

As shown above, going from the buildout of the sites pursuant to the current GPU designations to buildout under the proposed project would increase water demand by roughly of 231 AFY or 206,568 GPD. The City's water supply is sufficient to meet the projected demand increase see Section 2.4 for a description of available water resources throughout the City.

2.4 WATER SUPPLY

The City of Redlands water supply primarily compromises surface water from the Santa Ana River (SAR) and Mill Creek and supplemented by groundwater extracted from the Bunker Hill Basin (part of the San Bernardino Basin) and Yucaipa Basin. In addition, a small amount of imported water is utilized when needed. These resources and their management are described in the sections below.

2.4.1 PURCHASED OR IMPORTED WATER

Imported water from the State Water Project (SWP) is available for the City to purchase from Valley District when needed. The City has purchased supplemental SWP water only in years when surface water flows have not been able to meet demands and on occasion when surface

water supplies are turbid and require blending or for other operational purposes. The City will continue to request SWP water in these situations; however, during SWP outages or extended dry periods the City will prioritize use from other sources. If SWP water is not available in a future year, the City will shift to increase groundwater production and may implement conservation measures to reduce demands if needed. The City contributes to regional efforts to recharge the Bunker Hill groundwater basin with SWP water and local surface water in wet years when available so that storage is available for use in dry years when other supplies may be limited.

2.4.2 GROUNDWATER

Redlands extracts groundwater from the Bunker Hill Subbasin of the San Bernardino Basin (SBB) and Yucaipa Subbasin. The City's historical production for the past five years is shown in Table 11. Extractions shown include both potable and non-potable water. The high increase in the Yucaipa basin from 2018 to 2019 may have been due to increased drought conditions. Redlands can produce additional groundwater to meet increases in demand in drier years as described in more detail in Section 3.

Table 11 – Groundwater Volume Pumped (AF)

Type	Basin	2016	2017	2018	2019	2020
Alluvial Basin	Bunker Hill (part of SBB)	11,442	13,512	14,466	11,434	13,619
Alluvial Basin	Yucaipa	59	16	20	246	297
	TOTAL	**11,501**	**13,528**	**14,486**	**11,680**	**13,916**

Source: Table 4-8, City of Redlands chapter of the IRUWMP (July 2021).

SUSTAINABLE GROUNDWATER MANAGEMENT ACT (SGMA)

The Sustainable Groundwater Management Act (SGMA) was established in 2014 and requires local agencies to create groundwater sustainability agencies (GSAs) and groundwater sustainable plans (GSPs) for medium and high priority groundwater basins. There are multiple components that go into categorizing a priority level for the basins such as; current population and projected growth overlying the basin, number of public and private wells that draw from the basin, the irrigated acreage overlying the basin, the degree to which individuals rely on the groundwater as their primary source in the basin, and any external impacts on the basin. The San Bernardino Basin in the Upper Santa Ana Valley Area has 0 priority points making it very low on the priority level. The priority points were based on the urban, agricultural, and total groundwater use calculations, which equaled less than or equal to 9,500-acre feet per year. As discussed in the previous sections, the City of Redlands uses water from the Bunker Hill Basin and Yucaipa Basin. Approximately 1.2 of the 5 million acre-feet of storage of the Bunker Hill Basin is accessible for water demand. The Yucaipa Basin is approximately 22,000 acre-feet and 75% of the basin water (approximately 16,600 AF) is used for water demand [2].

[2] Source : https://groundwaterexchange.org/basin/upper-santa-ana-valley-3/

2.4.3 SURFACE WATER

The City receives its surface water from the Mill Creek Watershed and the Santa Ana River Watershed. Surface water is treated at the Henry Tate Surface Water Treatment Plant (SWTP) and the Horace P. Hinckley SWTP. The City has ownership in private and mutual water companies to supply water to the City's SWTPs. For decades the City has increased its ownership in these companies in an effort to increase its access to a reliable local source of water. Average surface water totals approximately 38 percent of the City's annual water production for the last several years. The City of Redlands sometimes supplements surface water supplies with SWP water, which is treated at the SWTP and distributed for potable use.

2.4.4 STORMWATER

Redlands is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the basins the City relies upon.

2.4.5 WASTEWATER AND RECYCLED WATER

The City is a sewer agency that treats approximately 5.9 million gallons of wastewater daily. The City's Wastewater Treatment Plant (WWTP) has the total capacity to treat 9.0 million gallons per day (MGD), up to 7.2 MGD of which can be treated to the tertiary level for Title 22 compliance. Treated wastewater distributed to City customers is tertiary effluent treated to Title 22 compliance. The City's recycled water customers include Southern California Edison (SCE) Company, a landfill and recycled/non-potable water customers. SCE uses recycled water as cooling water at its Mountain View Power Plant and recycled/non-potable water customers use recycled water for irrigation when supply is available. All remaining wastewater is treated to a secondary level and released into spreading basins located east of the WWTP for recharge back into Bunker Hill basin. In 2020, approximately 1.6 MGD of treated wastewater was used as recycled water supply for customers, and 3.4 MGD was used for recharge.

2.4.6 EXCHANGES, TRANSFERS, AND INTERTIES

Redlands exchanges water with Valley District and other local water agencies through various agreements. The City operates two interconnections – one with Western Heights Water Company and the other with the City of Loma Linda. In addition, Redland's water utility is in the process of updating its Water and Recycled Water Master Plans to identify needed distribution system upgrades as well as increase the reliability of its current water supplies.

2.4.7 WATER SUPPLY PROJECTIONS

The water supplies are utilized in the City to satisfy water demands. In 2020, the volume of water supplies was 28,098 AFY. Table 12 below shows projected supply sources for the City of Redlands.

Table 12 - Projected Water Supplies (AFY)

Water Supply	Additional Detail on Water Supply	Projected Water Supply				
		2025	2030	2035	2040	2045
		Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume	Reasonably Available Volume
Groundwater (not desalinated)	Bunker Hill (part of SBB)	12,973	13,922	14,861	15,677	16,484
	Bunker Hill – Recycled Water Recharge	3,766	4,015	4,275	4,513	4,760
	Yucaipa	1,000	1,000	1,000	1,000	1,000
Surface water (not desalinated)	Santa Ana River (part of SBB)	5,000	5,000	5,000	5,000	5,000
	Mill Creek (part of SBB)	5,500	5,500	5,500	5,500	5,500
Purchased or Imported Water	SWP - Direct Deliveries	700	700	700	700	700
Recycled Water	Recycled Water - Direct	2,100	2,100	2,100	2,100	2,100
TOTAL		**31,039**	**32,237**	**33,436**	**34,490**	**35,544**

Source: Table 4-12, City of Redlands Chapter of the IRUWMP (July 2021).

3. Regional Water Supply Reliability

It is important to project water supplies to meet demands into the future to ensure the proposed Project may be supported. The City's IRUWMP uses population, current and projected water supply and source data, water demand and source data, and factors that affect demands, to perform these projections.

The 2020 Integrated Regional Urban Water Management Plan (IRUWMP) was finalized in May 2021 and has been prepared in compliance with Water Code Sections 10608.20(e) of SB X7-7 and Sections 10608 through 10645 of the Urban Water Management Planning Act (Act). The information included in the 2020 IRUWMP represents the most current and available planning projections of supply capability and demand developed through a collaborative process with the member agencies, including the City of Redlands. The Act requires reporting agencies to describe their water reliability under a single dry-year, multiple dry-year, and average year conditions, with projected information in five-year increments for 20 years.

Supply analysis includes the surface water from Santa Ana River and Mill Creek and local groundwater from the Bunker Hill Basin (part of the San Bernardino Basin) and Yucaipa Basin and small amount of imported water from SWP. If the SWP water is not available, the City will shift to increase groundwater production by recharging the Bunker Hill Basin during the wet years to provide for the dry years.

The findings of the 2020 IRUWMP highlight that the City has supply capabilities that would be sufficient to meet expected demands from 2020 through 2045 under the normal, single dry-year and multiple dry-year conditions. The City also has proposed programs in place to ensure against water shortages in the future. These programs include projects such as the Water Shortage Contingency Plan (WSCP), as mentioned above. The WSCP provides a method of

supply and demand and steps to respond to drought conditions. In all climate scenarios, the City estimates potential surpluses in water supply through 2045.

The supply reliability assessment identifies the factors from the IRUWMP that could potentially limit the expected quantity of water available from the City's current source of supply through 2045, under normal years, single-dry years, and multiple dry years up to five consecutive years.

The normal year supply and demand comparison is outlined below in Table 13. The normal year represents the water supplies a supplier considers available during normal conditions. This could be a single year or averaged range of years that most closely represents the average water supply available. Under single dry and extended multiple drought year (5 years) conditions for the 2020 UWMP, the water supply reliability assessment assumes that demands will increase by as much as 10 percent due to increased outdoor water use. A single-dry year is defined as a single year of no to minimal rainfall within a period that average precipitation is expected to occur. An extended multiple drought year (5 years) is defined as the driest five-year historical sequence, which may be the lowest average water supply available for five years in a row. Although water use may decrease in the later years of a multiple year drought due to implementation of conservation measures and drought messaging, the assessment is based on a 10 percent increase throughout the 5-year drought to be conservative.

The City's demands in single dry years are assumed to increase by 10 percent above normal year demands. The local groundwater basins Redlands produces water from have storage for use in dry years allowing Redlands to produce the volume of water needed to meet all of its demands in single dry years. The IRUWMP recognizes that groundwater is no less vulnerable to seasonal and climatic changes than surface water (i.e., local and imported) supplies. The Western-San Bernardino Watermaster, in collaboration with the Basin Technical Advisory Committee (BTAC), monitor groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources.

Table 13 – Normal and Single Dry Year Supply versus Demand Comparison (AFY)

	2025	**2030**	**2035**	**2040**	**2045**
Supply Totals	31,039	32,238	33,436	34,490	35,544
Demand Totals	26,991	28,033	29,075	29,991	30,908
Surplus	4,048	4,205	4,361	4,499	4,636
Redlands RHNA Rezone Demand	**231**	**231**	**231**	**231**	**231**
Additional Available Capacity	**3,817**	**3,974**	**4,130**	**4,268**	**4,405**

Source: Table 4-15, City of Redlands chapter of the IRUWMP (July 2021).

The City's demands in multiple dry years are also assumed to increase by 10 percent above normal year demands. The local groundwater basins in Redlands produce water from storage for use in dry years, giving Redlands the ability to produce the volume of water needed to meet all of its net demands in single dry years. The City's supplies are 100 percent reliable during multiple dry years. The projected supply and demand during five consecutive dry years are shown in Table 14.

Table 14 - Multiple Dry Years Supply and Demand Comparison (AFY)

		2025	2030	2035	2040	2045
First – Fifth Dry Year	Supply Totals	34,143	35,461	36,780	37,939	39,098
	Demand Totals	29,690	30,836	31,982	32,990	33,998
	Surplus	4,453	4,625	4,797	4,949	5,100
	Redlands RHNA Rezone Demand	**231**	**231**	**231**	**231**	**231**
Additional Available Capacity		**4,222**	**4,394**	**4,566**	**4,718**	**4,869**

Source: Table 4-16, City of Redlands chapter of the IRUWMP (July 2021).

One factor that affects supply and demand is drought conditions. But since the region uses the local groundwater basins to simulate a large reservoir for long term storage, the effects of a local drought are not immediately recognized. If surface water flows and SWP supplies are reduced in dry years, the City will shift to increase groundwater production in Bunker Hill and increase conservation measures to reduce demands if needed. The City contributes to regional efforts to recharge the Bunker Hill groundwater basin with SWP water and local surface water in wet years when available so that storage is available for use in dry years. As a result, the City's total supplies are not reduced in dry years so 2020 is considered the base year for all year types. A Drought Risk Assessment (DRA) was performed for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because Redlands has access to groundwater basins with significant storage, total available supplies do not vary on a monthly or seasonal basis, therefore the analysis was conducted on an annual basis. Based on the analysis, the City does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, the City participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources.

The City implements a water shortage contingency plan (WSCP) to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies. The WSCP is a strategic plan that Redlands uses to prepare for and respond to foreseeable and unforeseeable water shortages. A water shortage occurs when water supply available is insufficient to meet the normally expected customer water use at a given point in time. A shortage may occur due to water quality changes, climate change, drought, regional power outage, and catastrophic events (e.g., earthquake). Additionally, the State may declare a statewide drought emergency and mandate that water suppliers reduce demands, as occurred in 2014. The WSCP serves as the operating manual that Redlands will use to prevent catastrophic service disruptions through proactive, rather than reactive, mitigation of water shortages. The WSCP provides a process for an annual water supply and demand assessment and structured steps designed to respond to actual conditions. The level of detailed planning and preparation provide accountability and predictability and will help the City maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

3.1 CITY OF REDLANDS LOCAL WATER SUPPLY RELIABILITY

The City of Redlands is required to assess the reliability of their water service to its customers under normal, single-dry and multiple-dry water years. As mentioned above, the City depends on a combination of surface water from SAR and Mill Creek and local groundwater supplies

from Bunker Hill Basin to meet its water demands. The City has taken numerous steps to ensure it has adequate supplies to provide for growing demands.

The City has several water demand management measures and resources that further decrease water demands and assist to ensure sustainable water supply for future generations. Some of the main requirements are summarized below [3]:

- **Residential**
  - Outdoor watering is restricted to only certain days of the week for certain address's (even addresses versus odd addresses) and no watering on Wednesdays completely.
  - No watering is permitted between the hours of 12:00 p.m. and 8:00 p.m.
  - Controllable leaks must be repaired immediately.
  - No washing down sidewalks, driveways, parking areas, patios, tennis courts, and other paved areas.
  - No washing vehicles with a hose, unless the hose is fitted with a shut-off nozzle and is completed on the assigned address day of the week not during the hours of 12:00 p.m. and 8:00 p.m.
  - No operating a fountain or decorative water feature, unless the water is part of a recirculating system.
  - No outdoor watering during and 48 hours following measurable rainfall.
  - Refilling or adding of water to swimming/wading pools or spas is allowed only on designated irrigation days and prohibited between 12:00 p.m. and 8:00 p.m.

- **Businesses**
  - Restaurants, cafes and bars can only serve water to customers on request.
  - Hotels and motels must prominently display a notice providing guests with the option of choosing not to have towels and linens laundered daily.
  - Use of water from fire hydrants is limited to firefighting and other activities necessary to maintain the health, safety, and welfare of the citizens of Redlands

In addition, landscape policies have also been modified to allow drought tolerate landscape throughout the City. Approximately 70% of water use in Redlands is attributed to outdoor irrigation. Programs in the Water Efficiency Rebate Program such as; Weather Based Irrigation Controllers (WBIC's) and Drought Tolerant Lawn Conversions, have been successful in reducing water demands throughout the City's service area.

[3] Source: https://www.cityofredlands.org/post/watering-restrictions

4. Conclusion

The proposed Redlands RHNA Rezone project includes changes to the land use of the commercial/industrial and multi-family residential areas. These changes result in a net annual increase of 231 AFY or 206,568 GPD, bringing the total demand of the project site to 457 AFY. The City of Redlands sources the majority of its water supplies from local surface water, groundwater, treated wastewater, raw water, and purchased (imported) water. When necessary, supplemental sources from the State Water Project (SWP) are utilized. Additionally, recycled water is available for outdoor irrigation and other non-potable uses.

Despite the additional water demand from the Redlands RHNA Rezone project, the City will maintain surplus water supplies of up to 3,817 to 4,869 AF of water over the next 25 years under varying drought conditions. This WSA includes an analysis of the reliability of the City's water supplies and concludes that supplies throughout the City are sufficient to accommodate the RHNA Rezone project during normal, single-dry, and multiple dry years. The assessment identifies programs and activities that the City is effectively managing and enforcing to lower water demand and support sustainable water supply for the future. Overall, the City of Redlands, inclusive of the proposed Redlands RHNA Rezone project, will have an adequate supply of water both now and 25 years into the future.