2020 PART 2: LOCAL AGENCY UWMPs

UPPER SANTA ANA RIVER WATERSHED

INTEGRATED REGIONAL URBAN WATER MANAGEMENT PLAN

TABLE OF CONTENTS

SAN BERNARDINO VALLEY MUNICIPAL WATER DISTRICT

2020 IRUWMP

Part 2 Chapter 1

Valley District 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

1

WHOLESALE URBAN WATER MANAGEMENT PLAN

San Bernardino Valley Municipal Water District

This chapter describes information specific to the San Bernardino Valley Municipal Water District, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is consistent with and supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the San Bernardino Valley Municipal Water District's reporting requirements for 2020 under the UWMP Act. Supporting Information is included in Part 4 Appendix A.

Valley District was formed in 1954, under the Municipal Water District Act of 1911 (California Water Code Section 71000 et seq.) as a regional agency to plan a long-range water supply for the San Bernardino Valley. It imports water into its service area through participation in the SWP and manages groundwater storage within its boundaries. Its enabling act includes a broad range of powers to provide water, wastewater and stormwater disposal, recreation, and fire protection services. Valley District is a wholesale water agency and does not deliver water directly to retail water customers.

A map illustrating Valley District's service area is shown in **Figure 1-1**.

IN THIS SECTION

- System Description
- Water Supply and Uses
- Water Service Reliability
- Drought Risk Assessment
- Water Shortage Contingency Plan Summary
- Demand Management Measures
- Adoption

Valley District covers about 353 square miles mainly in southwestern San Bernardino County, about 60 miles east of Los Angeles. It spans the eastern two-thirds of the San Bernardino Valley, the Crafton Hills, and a portion of the Yucaipa Valley and includes the cities and communities of San Bernardino, Colton, Loma Linda, Redlands, Rialto, Fontana, Bloomington, Highland, East Highland, Grand Terrace, Mentone, and Yucaipa.

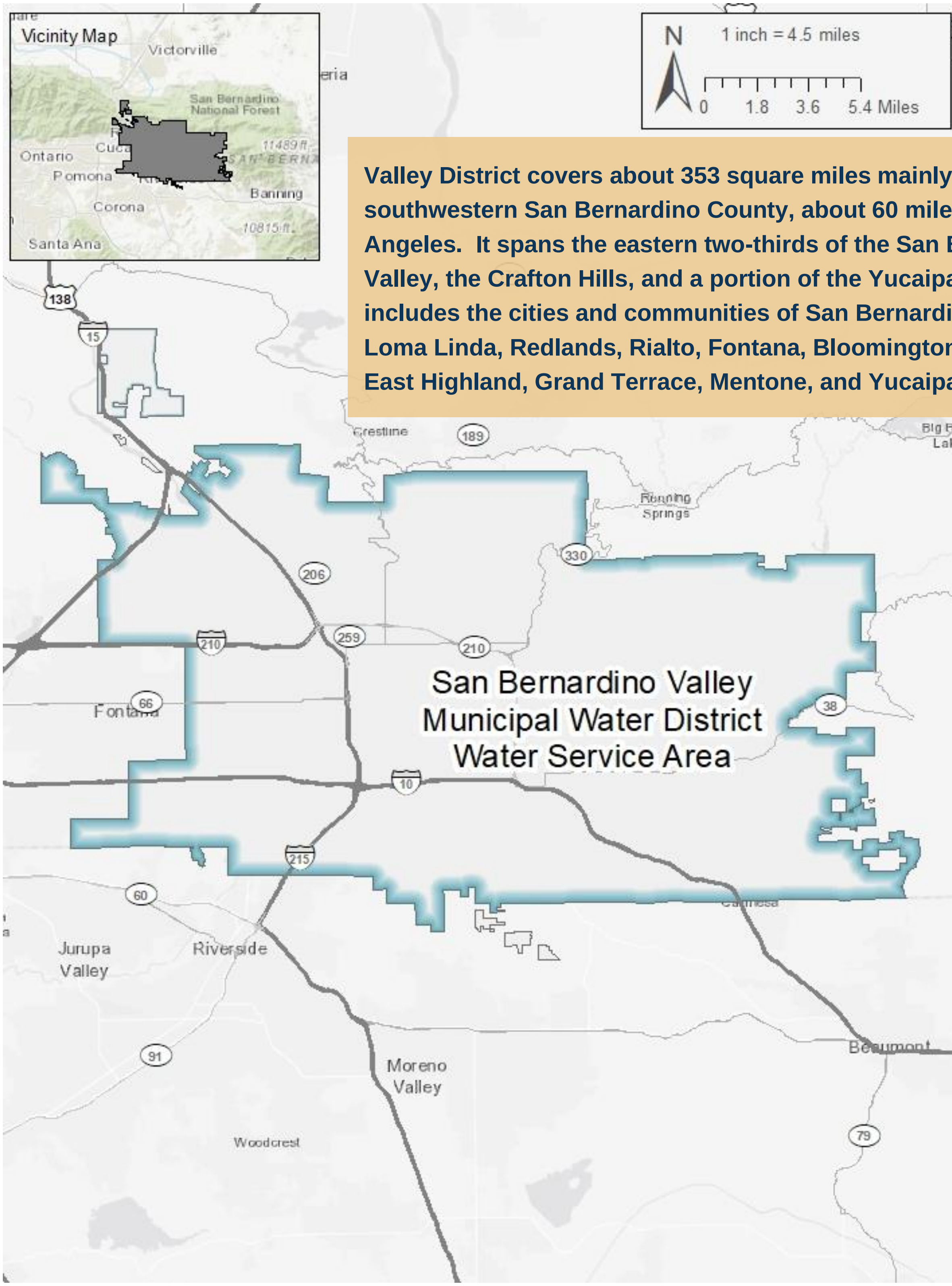


Figure 1-1: San Bernardino Valley Municipal Water District Water Service Area Map

1.1 System Description

Valley District is responsible for long-range water supply management, including importing supplemental SWP water, and is responsible for storage management of most of the groundwater basins within its boundaries and imports water from the State Water Project (SWP) that can be used to increase groundwater extractions for the retail agencies within its service area over their specified limit in the Western Judgment explained below. Valley District serves as the Watermaster, on behalf of the retail agencies in its service area, to ensure the region's continued compliance with both the Western Judgment and the Orange County Judgment. Valley District has also taken on the role of facilitating water resource planning for the region.

Valley District is a State Water Contractor that oversees the region's $1 billion investment in the SWP for a supplemental water supply. Valley District takes delivery of SWP water at the Devil Canyon Power Plant Afterbay, which is located just within the northwestern corner of its boundary. Water can then be conveyed east or west to various treatment plants and spreading grounds. For more information, see **Part 1 Chapter 3**.

1.1.1 Climate

The regional climate, including Valley District's service area, is described in **Part 1 Chapter 2**.

1.1.2 Population

To estimate the 2020 and future year population in the Valley District service area, projections from the Southern California Association of Governments (SCAG) were used. SCAG has developed a forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and in 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. The service area boundary was intersected with a GIS shapefile of the SCAG TAZs to provide an estimate of population within the service area for years 2020, 2035, and 2045. These estimates were used to calculate compound annual population growth rates for years 2020-2035 and 2035-2045, which were used to estimate population for 2025, 2030 and 2040. Estimated 2020 and future year population is shown in **Table 1-1**.

SCAG prepares demographic forecasts based on land use data for their region. Their process emphasizes input from local planners and is done in coordination with local or regional land use authorities. It incorporates essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Table 1-1: DWR 3-1W Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**715,859**	**747,984**	**781,550**	**816,622**	**843,974**	**872,242**

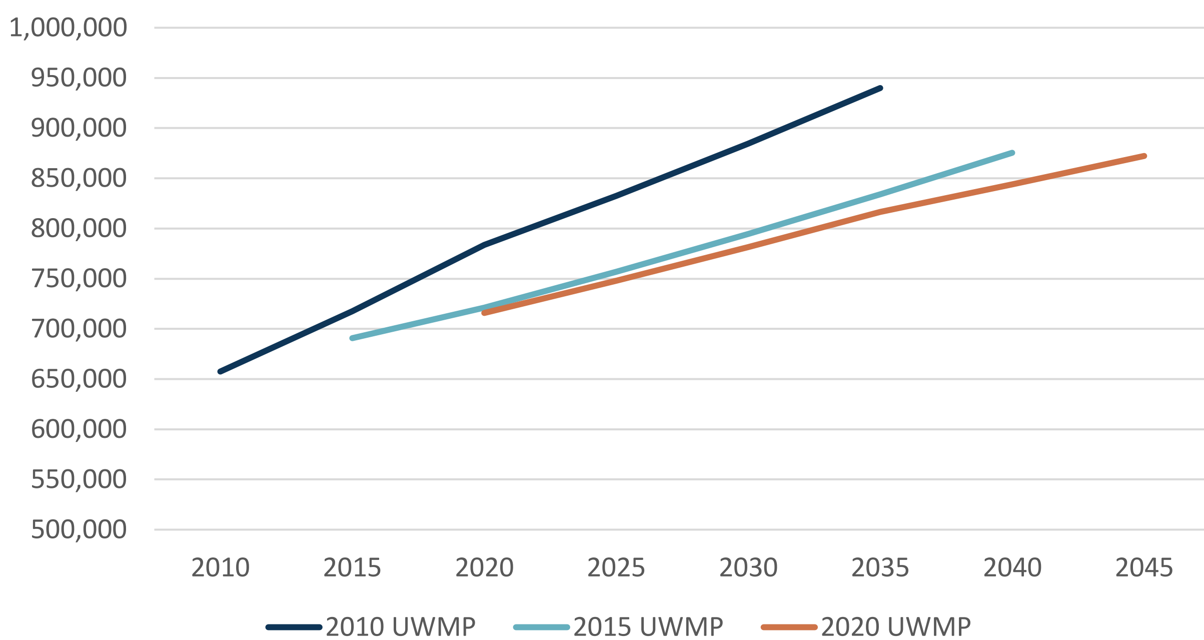
Total 715,859 747,984 781,550 816,622 843,974 872,242

As described in Part 1 Chapter 2, SCAG population growth projections have declined significantly in the last 10 years due to a variety of demographic factors described in SCAG's latest 2020 Demographics and Growth Forecast.

Table 1-2. Population Projection Trends for the Valley District Service Area

PLAN	2010	2015	2020	2025	2030	2035	2040	2045
2010 RUWMP	657,500	717,785	783,598	832,578	884,620	939,915		
2015 RUWMP		690,758	721,223	757,015	794,584	834,017	875,407	
2020 IRUWMP			715,859	747,984	781,550	816,622	843,974	872,242

Figure 1-2. Population Projection Trends for the Valley District Service Area



1.2 Water Supply

As discussed in **Part 1 Chapter 3**, Valley District is a State Water Contractor and imports SWP Water into its service area for direct deliveries and groundwater recharge. Valley District is a wholesale water agency that provides water to the retail water agencies within its boundary.

Valley District also delivers groundwater from the SBB through its Baseline Feeder system to WVWD, Rialto and RHWC. The water delivered through the Baseline Feeder is accounted for in these retail water agency's respective UWMP chapters since they are the agencies serving the water to their customers.

1.2.1 Water Exchanges and Transfers

Valley District evaluates potential transfers and exchanges to make best use of available supplies. In some years Valley District has sold some of its surplus State Water Project water to other neighboring State Water Contractors.

Valley District just recently entered into agreements that offer any surplus SWP water first to the San Gorgonio Pass Water Agency (up to 5,000 acre-feet) with the remainder being offered Metropolitan that requires 50% of the water to be offered to the SARCCUP. Metropolitan and its member agencies that are participating in SARCCUP have also developed a companion agreement that describes how SARCCUP will function within Metropolitan's existing policies.

Both agreements are included in Part 3 Appendix B.

1.2.2 Future Water Projects

Valley District not only provides SWP water and groundwater through the Baseline Feeder but is also actively planning other local water supply projects. Valley District has a Local Resources Investment Program (LRIP) that provides a financial incentive to agencies that develop recycled water and/or stormwater capture projects. In addition, Valley District is also planning other regional projects which are discussed in detail in **Part 1 Chapter 3** which include the regional distribution of recycled water, conjunctive use projects, stormwater capture and two proposed enhancements to the SWP, Sites Reservoir and Delta Conveyance.

Valley District is also facilitating the development of the Upper Santa Ana River Watershed Habitat Conservation Plan which will provide environmental permits for the various water supply projects.

1.2.3 Summary of Existing and Planned Sources of Water

Valley District's primary supplemental water supply is the SWP which will also include deliveries from Sites Reservoir, which is expected to come online by 2040. Valley District has imported nearly 1 million acre-feet of SWP water into its service area as shown in **Figure 1-3**. Detailed descriptions of Valley District's supplies are included in **Part 1 Chapter 3**. Projects supplies are shown in **Table 1-3.**

Figure 1-3. SWP Deliveries into Valley District Service Area, 1972-2020 (AF)

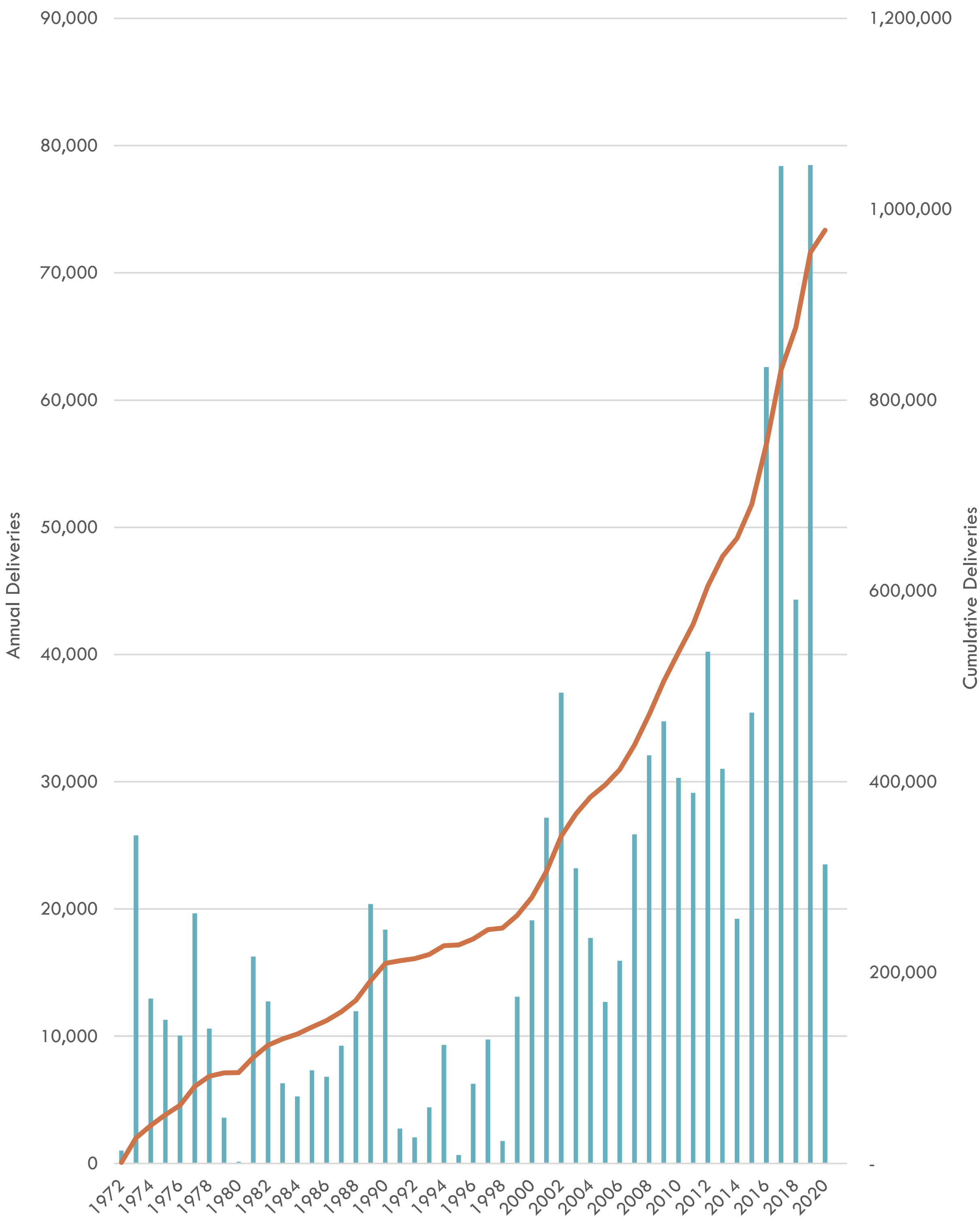


Table 1-3. DWR 6-9W Projected SWP Water Supplies, AFY

		PROJECTED WATER SUPPLY									
		2025		2030		2035		2040		2045	
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	REASONABLY AVAILABLE VOLUME	TOTAL RIGHT OR SAFE YIELD	REASONABLY AVAILABLE VOLUME	TOTAL RIGHT OR SAFE YIELD	REASONABLY AVAILABLE VOLUME	TOTAL RIGHT OR SAFE YIELD	REASONABLY AVAILABLE VOLUME	TOTAL RIGHT OR SAFE YIELD	REASONABLY AVAILABLE VOLUME	TOTAL RIGHT OR SAFE YIELD
Purchased or Imported Water	State Water Project Table A	59,508	102,600	59,508	102,600	59,508	102,600	53,352	102,600	53,352	102,600
Supply from Storage	Sites Reservoir							12,100	12,100	12,100	12,100
	TOTAL:	**59,508**	**102,600**	**59,508**	**102,600**	**59,508**	**102,600**	**65,452**	**114,700**	**65,452**	**114,700**

1.2.4 Energy Intensity

A new requirement for 2020 UWMPs is to include information on the amount of energy used in their water system, which can be used to calculate energy intensity.

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

Most of Valley District's energy consumption comes from the energy required to deliver SWP water to the region. The SWP is also one of the largest, if not the largest, producers of power in the state. The Department of Water Resources owns and operates the SWP on behalf of the State Water Contractors who pay all of the costs. Valley District and the other SWCs are working with DWR on possible ways to use the SWP to generate energy when it is most needed and use energy when there is less demand.

Energy costs are embedded in the variable charges billed to Valley District by DWR as a result, Valley District does not currently have access to energy use data for their water system.

Valley District is planning to develop a Climate Adaptation and Resilience Plan (CARP) that will serve as a comprehensive policy and strategy document for addressing the undesirable impacts of climate change and will identify targeted policies, programs, and projects that will both mitigate Valley District's contribution to greenhouse gases and increase their adaptive capacity. As part of this process, Valley District will conduct a service area-wide climate change risk/hazard and vulnerability assessment, providing a detailed review of anticipated climate-related risks to Valley District's various water supplies, infrastructure, facilities, operations, headwaters, and habitat conservation investments. Additionally, a GHG inventory will be prepared that lists all of Valley District's local emission sources (outside of the SWP) and the associated emissions will be quantified using standardized methods and will evaluate how Valley District can reduce their energy intensity and contribution to carbon emissions.

1.3 Water Use

This section describes the current and projected water uses within Valley District's service area. Valley District serves untreated SWP water for groundwater recharge, direct deliveries to agencies, deliveries to SGPWA, and supply into storage.

1.3.1 Water Use by Sector

1.3.1.1 Past Water Use

Valley District's actual water use by type from 2016-2020 is shown in **Table 1-4** and **Figure 1-4.** During this period, Valley District recharged nearly 170,000 AF of SWP water. The losses shown in **Table 1-4** are the difference between DWR meter readings and Valley District meter readings for SWP deliveries and are not considered real losses. Losses are not shown in **Figure 1-4**.

1.3.2 Projected Water Use

Projected future uses of Valley District's SWP water are presented in detail in **Part 1 Chapter 4** and summarized in in **Table 1-5** and **Figure 1-5**. Valley District plans to fully utilize its investment in the region's available SWP supplies; any surplus water will be sold per the agreements mentioned previously.

1.3.3 Climate Change Considerations

As discussed in **Part 1 Chapter 5**, the Region has applied a 15% Reliability Factor to the overall supply portfolio for the Region to account for uncertainties in supply and demand projections, long-term drought and any effects of climate change. This 15% Reliability Factor is recommended by the RAND Corporation's independent analysis of the uncertainty related to water supplies and demands in the 2015 RUWMP.

Valley District's SWP supply projections are based on DWR's 2019 Delivery Capability Report, which incorporates the effects of sea level rise and anticipated changes in precipitation and runoff patterns in the future supply projections.

Table 1-4. Actual Water Use from 2016-2020 (AFY)

	ACTUAL WATER USE				
USE TYPE	2016	2017	2018	2019	2020
Groundwater Recharge	23,327	53,607	22,524	60,886	6,933
Direct Deliveries	34,534	24,732	22,475	16,752	15,746
Local Surface Storage	676	1,858	835	858	889
Carryover	3,761	17,605	12,080	12,317	16,707
Losses (Difference between DWR and Valley District meter readings)	4,549	(1,800)	(1,527)	(130)	(64)
TOTAL	**66,848**	**96,001**	**56,388**	**90,795**	**40,211**

Figure 1-4. Actual Water Use from 2016-2020 (AFY)

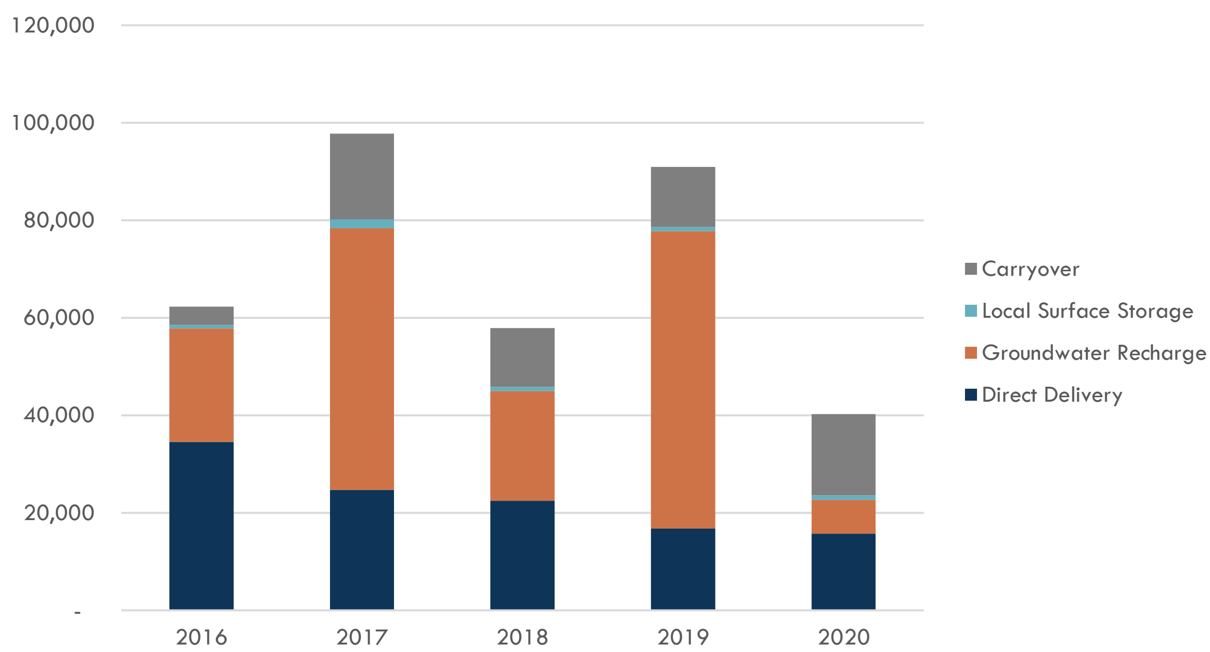
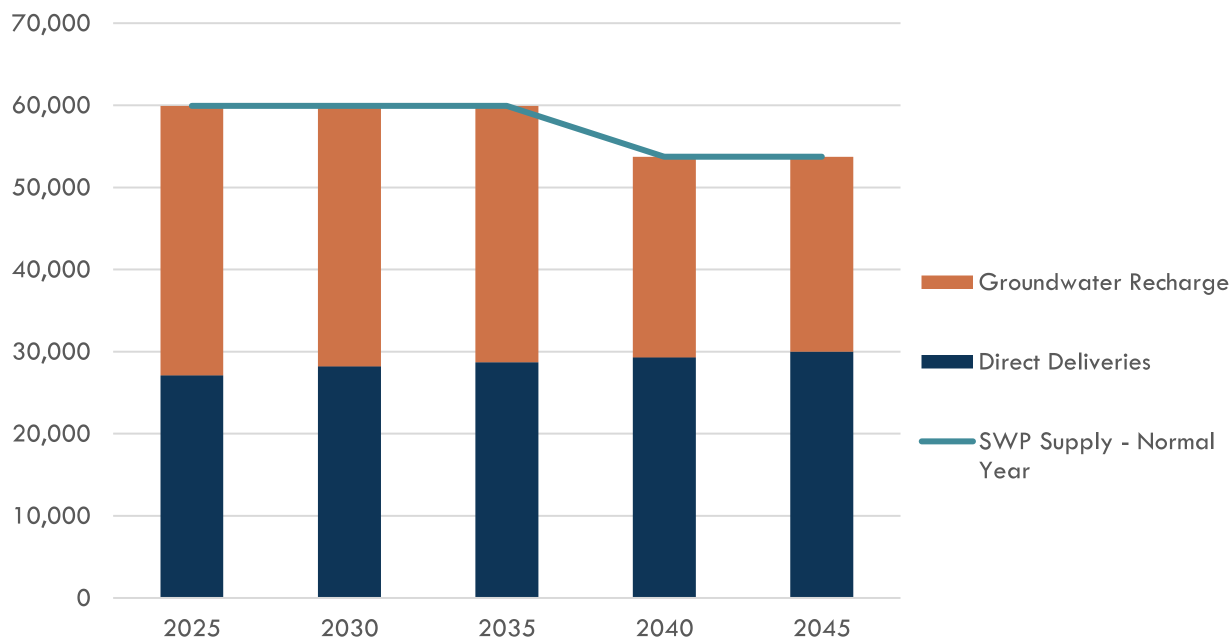


Table 1-5: DWR 4-2W Projected Uses of SWP Water

USE TYPE	ADDITIONAL DESCRIPTION	PROJECTED WATER USE 2025	2030	2035	2040	2045
Sales/Transfers/Exchanges to Other Agencies	Direct Deliveries	27,108	28,209	28,702	29,288	29,984
Sales/Transfers/Exchanges to Other Agencies	Groundwater Recharge	32,400	31,299	30,806	36,164	35,468
	TOTAL:	**59,508**	**59,508**	**59,508**	**65,452**	**65,452**

Figure 1-5. Projected Uses of SWP Water



1.4 Water Service Reliability Assessment

The overall water supply reliability for the Region is presented in **Part 1 Chapter 5** and demonstrates that the Region has adequate supplies to meet demands under various conditions for the next 25 years, including a 15% Reliability Factor.

In compliance with the UWMP Act requirements for wholesale suppliers, this section presents Valley District's imported water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. Key considerations and data used for Valley District's SWP supply reliability is discussed in detail in **Part 1 Chapter 3.2.3**. In dry years when SWP supplies are limited, the region prioritizes direct delivery requests for surface water treatment plants and the retail agencies pump stored groundwater to meet any remaining water demands. This management strategy of storing wet year water in the groundwater basins for later use during droughts enables the region to meet all imported water demands in all year types. The results of the reliability assessment are summarized in the tables below.

The projected supply and demand during a normal year are shown in **Table 1-6**.

Table 1-6. DWR 7-2W Normal Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals (From Table 6-9W)	59,508	59,508	59,508	65,452	65,452
Demand Totals (From Table 4-3W)	59,508	59,508	59,508	65,452	65,452
DIFFERENCE:	**0**	**0**	**0**	**0**	**0**

The projected supply and demand during a single dry year are shown in **Table 1-7**.

Table 1-7. DWR 7-3W Single Dry Year Supply and Demand Comparison

	2025	2030	2035	2040	2045
Supply Totals	15,130	15,130	15,130	45,530	45,530
Demand Totals	15,130	15,130	15,130	45,530	45,530
DIFFERENCE:	**0**	**0**	**0**	**0**	**0**

The projected supply and demand during five consecutive dry years are shown in Table 1-8.

Table 1-8. DWR 7-4W Multiple Dry Years Supply and Demand Comparison

		2025	2030	2035	2040	2045
FIRST YEAR	Supply Totals	26,676	26,676	26,676	52,972	52,972
	Demand Totals	26,676	26,676	26,676	52,972	52,972
	DIFFERENCE:	**0**	**0**	**0**	**0**	**0**
SECOND YEAR	Supply Totals	26,676	26,676	26,676	52,972	52,972
	Demand Totals	26,676	26,676	26,676	52,972	52,972
	DIFFERENCE:	**0**	**0**	**0**	**0**	**0**
THIRD YEAR	Supply Totals	26,676	26,676	26,676	52,972	52,972
	Demand Totals	26,676	26,676	26,676	52,972	52,972
	DIFFERENCE:	**0**	**0**	**0**	**0**	**0**
FOURTH YEAR	Supply Totals	26,676	26,676	26,676	52,972	52,972
	Demand Totals	26,676	26,676	26,676	52,972	52,972
	DIFFERENCE:	**0**	**0**	**0**	**0**	**0**
FIFTH YEAR	Supply Totals	26,676	26,676	26,676	52,972	52,972
	Demand Totals	26,676	26,676	26,676	52,972	52,972
	DIFFERENCE:	**0**	**0**	**0**	**0**	**0**

1.5 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. This analysis uses the supply and demand assumptions for the 2025 period in the Water Service Reliability Analysis presented in **Table 1-8** and described in detail in **Part 1 Chapter 3.2.3**. In dry years when SWP supplies are limited, Valley District prioritizes direct delivery requests for surface water treatment plants and collaborates with the retail agencies to align their collective demands with available supplies. Retail agencies use groundwater in storage to meet any remaining water demands.

Since the region has experienced an extended drought of 20 years in the past and is currently in the midst of a 22-year drought, and counting, the region also evaluated a 30-year drought which is presented in **Part 1 Chapter 5**.

Table 1-9: Five-Year Drought Risk Assessment

2021	Gross Water Use	26,676
	Total Supplies	26,676
	SURPLUS/SHORTFALL	**0**
2022	Gross Water Use	26,676
	Total Supplies	26,676
	SURPLUS/SHORTFALL	**0**
2023	Gross Water Use	26,676
	Total Supplies	26,676
	SURPLUS/SHORTFALL	**0**
2024	Gross Water Use	26,676
	Total Supplies	26,676
	SURPLUS/SHORTFALL	**0**
2025	Gross Water Use	26,676
	Total Supplies	26,676
	SURPLUS/SHORTFALL	**0**

1.6 Water Shortage Contingency Plan

Part 1 of this Plan describes the water supplies available to meet the urban water demand in the Valley District service area and the Region. A water shortage is defined as a time when the available water supply is insufficient to meet the customer demand. Since the region includes 12 million acre-feet of groundwater storage space that is approximately 80% full and also has a diverse water portfolio and systems redundancy, the risk of a water shortage is very low. Valley District's primary contingency strategy is to store water in wet years in local groundwater basins, which retail agencies can pump in dry years. To ensure that retail agencies have the capacity to pump the stored water, Valley District's Resolution 888 requires retail agencies taking direct delivery of imported to maintain the capacity to sustain full-service requirements during any interruption of service from District facilities.

Valley District's Regional Water Shortage Contingency Plan (Regional WSCP) is independent of the WSCPs adopted by each of the retail urban water suppliers in the region and does not dictate the water shortage levels and response actions implemented by each of the retail agencies. Each retail agency has adopted their own WSCP that defines how their agency will respond in the event of a water shortage that impacts their customers. The Regional WSCP is intended to be aligned with retail agency WSCPs to facilitate a coordinated regional response, but each agency will perform independent assessments of their unique water supply reliability and make their own decisions about whether to implement shortage stages and response actions contained in their respective WSCPs.

The Regional WSCP describes the coordinated regional water management procedures that Valley District and the BTAC have been conducting for many years to prevent catastrophic service disruptions through proactive mitigation of potential regional water shortages. The Regional WSCP provides a process for an annual water supply and demand assessment and a range of actions that could be implemented to respond to actual conditions. This extension of the ongoing regional planning and coordination process will help the region continue to maintain reliable supplies and reduce the impacts of any local supply shortages and/or interruptions that may impact more than one retail agency.

> This Regional WSCP was prepared in collaboration with the BTAC in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. The Regional WSCP is attached in Part 4 Appendix A-8.

1.7 Demand Management Measures

Valley District has consistently invested in water conservation efforts since its Water Conservation Master Plan was first adopted in 2007. The demand reduction measures in the Master Plan were incorporated into the 2010 RUWMP and the 2015 RUWMP update and are making a measurable impact on demand reduction. The combined investment by Valley District and retail agencies have yielded significant water savings. All retail agencies within Valley District's service area met their 20x2020 targets. Despite an increase in the service area population by 7% since 2010, demand has fallen by 15% or 32,840 acre-feet over the decade.

Valley District is progressively launching a comprehensive Demand Management Program that will use Demand Management Measures (DMMs) as the basis for funding and assessing the performance of water conservation measures, programs, and incentives within the Region. This data-oriented and performance-based approach will allow Valley District to fund a wide range of water conservation measures, programs and incentives proposed by retail suppliers that will have a greater impact on reducing the total amount of water use. It will also fund complementary efforts by cities, utilities, resource management entities, and community organizations.

The overarching goal is consistent demand management into the future. The proposed program will include both demand-side and supply-side conservation and will be cost effective through economies of scale and leveraging grant funding for the service area. The program will focus on enhancing the technical, managerial and financial capacity of retail agencies to deliver on urban water conservation and utilize broad-based partnerships and public engagement to help the retail agencies meet their upcoming water use objectives. While each agency's conservation objectives will not be developed until 2023, the retail water agency's first reports will require the specific DMMs they will implement to meet their objectives. As such, the Valley District Demand Management Program will support the retail agencies and help them achieve their goals.

Figure 1-6. Valley District Demand Management Program Elements

The following sections summarize Valley District's efforts to promote conservation and protect local water supplies. Additional efforts being implemented by individual retail agencies are described in their respective UWMPs.

1.7.1 Metering

All of Valley District's service connections are metered. Valley District calibrates these meters regularly and repairs or replaces meters whenever necessary.

1.7.2 Public Education and Outreach

Valley District's public education and outreach efforts include marketing of rebates and giveaways, providing school and community education programs, information booths at fairs and public events, informative websites, online tools, social media, or newspaper articles.

Some ideas for the proposed Regional Conservation Program include:

- Community Outreach Program
  - Speaker's Bureau and Presentations
  - Ambassadors/Champions/Influencers-based WUE Outreach Campaign (Traditional and Social Media)
  - Customer Engagement
  - Conservation-Oriented Special Events
  - Youth and Citizen's Engagement. E.g., Valley District Academy
- Regional Education
  - K-12 Teacher Grant, College Annual Water Scholar, and Water Wizards (High School)
  - Qualified Water Efficient Landscaper (QWEL) Program/Landscape Industry Training & Outreach
  - WaterSense

1.7.3 Water Conservation Program Coordination and Staffing Support

Since 2007, Valley District has assigned staff to provide conservation program coordination and support the efforts of retail agencies. In 2020, Valley District hired a dedicated, full-time Water Conservation Program Manager position who will be responsible for implementing the Demand Management Measures.

1.7.4 Asset Management Program

Valley District has a facility management system to help with annual maintenance of its system and is planning to develop an asset management program.

1.7.5 Wholesale Supplier Assistance Programs

Valley District has long supported the retail agencies in a wide range of water conservation initiatives from rebates to landscape workshops and installation of smart irrigation devices. Valley District pays 25%-50% of program costs initiated and implemented by retail water agencies that provide rebates and other programs to their customers.

Beginning in 2021, Valley District will proactively and continually provide assistance through a partnership relationship with retailers in order to drive water use efficiency success regionally and locally.

Valley District's support will be far reaching, providing the following:

- Custom Plan Development
- Water Budget Compliance Assessment & Support
- Budget-based Water Rate Evaluation & Implementation
- Program Implementation Support & Funding
- Performance Tracking

Valley District will assist each retailer with creating custom plans, specifically addressing the needs and make up of their community and organization. Valley District has built a menu of potential programs for retailers to consider and retailers will have the option of mixing and matching any combination of programs which will achieve their savings goals.

These programs include both regional and local implementation options including:

- The Online Store for water saving products
- Large Landscape Concierge Program
- Water use Efficiency Innovation Grant
- Turf Removal Rebates
- Irrigation Tune-up Program
- Leak Detection Device Incentive
- General Rebates for Plumbing Fixtures, Appliances, & Irrigation Equipment
- Smart Irrigation Direct Installation
- School Smart Irrigation Program
- Low Income/Disadvantaged Community Leak Repair Program

The goal is to increase the contribution of demand management to regional water supply reliability and assist retail agencies meet their urban water use objectives.

1.8 Adoption, Submittal, and Implementation

This section describes Valley District's process for adopting, submitting, and implementing the 2020 IRUWMP and Valley District's Regional WSCP.

1.8.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to Valley District's public hearing. The recipients are identified in **Part 4 Appendix A-2** and include all cities and counties within Valley District's service area as well as other stakeholders. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

Valley District provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4 Appendix A-2**.

1.8.2 Public Hearing and Adoption

Valley District held a public hearing on June 15, 2021, to hear public comment and consider adopting this 2020 IRUWMP and Valley District's Regional WSCP.

The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed Valley District the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

Valley District's adoption resolution for the 2020 IRUWMP and Valley District's WSCP is included in **Part 4 Appendix A-3**.

1.8.3 Plan Submittal

Valley District will submit the 2020 IRUWMP and Valley District's Regional WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. 2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

1.8.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, Valley District will make the plan available for public review by posting the plans on the Valley District website for public viewing.

1.8.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or Valley District’s Regional WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

CITY OF COLTON

2020 IRUWMP

Part 2 Chapter 2

Colton 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

2

RETAIL URBAN WATER MANAGEMENT PLAN

City of Colton

This chapter describes information specific to the City of Colton, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the City of Colton's reporting requirements for 2020 under the UWMP Act.

The City of Colton Water Department (Colton) is the municipally owned utility that provides potable and non-potable water at retail to customers primarily within the City of Colton. Colton is a retail public water supplier that meets the definition of an urban water supplier with over 10,200 municipal water service connections in 2020.

The City of Colton was incorporated in 1887 and is bounded by the City of San Bernardino on the north and northeast, the City of Grand Terrace and unincorporated areas of Riverside County on the south, the City of Loma Linda on the east, and the City of Rialto on the west.

Colton's service area covers approximately 90 percent of the City of Colton. It includes 14 square miles in the City of Colton and approximately 0.8 square miles of unincorporated area in San Bernardino County. **Figure 2-1** shows the boundary of the Colton Water Service Area.

IN THIS SECTION

- System Description
- Water Use
- SBX7-7 Compliance
- Water Supply
- Water Service Reliability
- Drought Risk Assessment
- Water Shortage Contingency Plan Summary
- Demand Management Measures
- Adoption, Submittal, and Implementation

Colton provides water service for domestic consumption, fire protection, and irrigation customers within its service area. Colton's existing potable water system facilities consist of 7 wells, 4 main booster pumping plants, 6 water storage reservoirs, 2 pressure reducing facilities, and over 120 miles of water transmission and distribution pipelines.

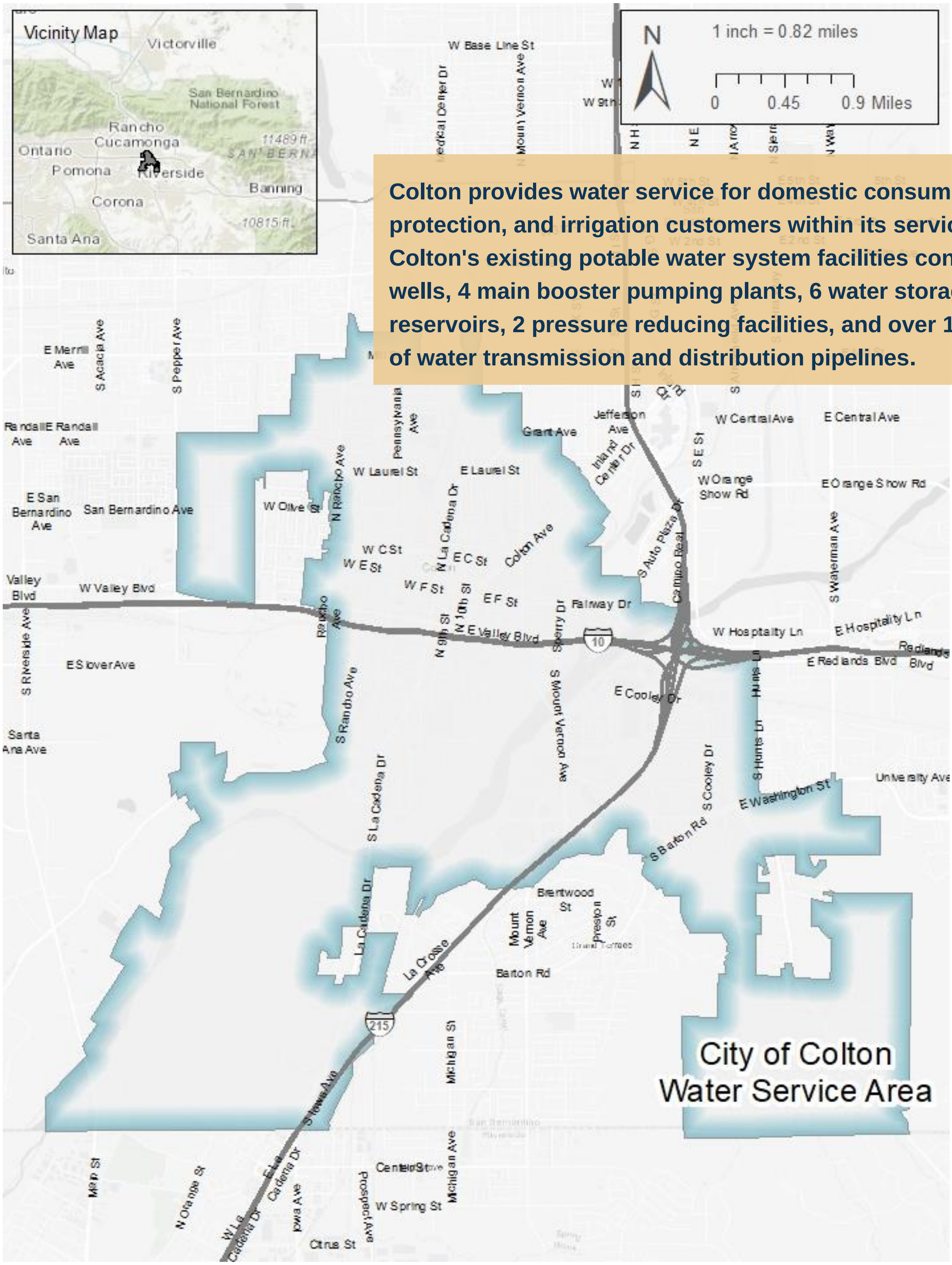


Figure 2-1: City of Colton Water Service Area Map

2.1 System Description

This section describes the population and land uses within Colton's service area.

2.1.1 Population

For the purposes of consistent reporting of population estimates, the California Department of Water Resources (DWR) has developed a GIS-based tool (DWR Tool) to estimate the population within a water agency's service area using census data and number of water service connections. The DWR Tool was used to intersect the service area boundary with census data to provide population estimates for 1990, 2000, and 2010. The DWR Tool uses the number of service connections in those prior census years, where available, to calculate a persons-per-connection factor, which is then projected forward to estimate population in a given year using the number of connections in that year. The service area population for 2020 was estimated in the DWR Tool using the number of connections in 2010 and 2020.

Prior to drafting this UWMP, Colton prepared an estimate of 2020 population of 47,187 based on the number of single family connections and an assumed number of persons per connection, and a detailed investigation of the number of actual multi-family dwellings in the service area and an assumed number of persons per dwelling. This estimate takes into account that multiple dwellings may be provided water by a single service. However, for purposes of this report, the DWR Tool output of 46,525 was assumed to be the official estimate of population in 2020, and serves as the basis for SBx7-7 compliance calculations and all future population projection years.

To estimate population for future years, projections from the Southern California Association of Governments (SCAG) were used. SCAG has developed a forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and in 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. The service area boundary was intersected with a GIS shapefile of the SCAG TAZs to provide an estimate of population within the service area for years 2020, 2035, and 2045. These estimates were used to calculate compound annual population growth rates for years 2020-2035 and 2035-2045. The population growth rates were applied to the 2020 population to estimate future population. Estimated 2020 and future year population is shown in **Table 2-1**.

Per SCAG requirements, it must be noted that this population modeling analysis was performed by Water Systems Consulting, Inc. based upon modeling information originally developed by SCAG. SCAG is not responsible for how the model is applied or for any changes to the model scripts, model parameters, or model input data. The resulting modeling data does not necessarily reflect the official views or policies of SCAG. SCAG shall not be held responsible for the modeling results and the content of the documentation.

SCAG prepares demographic forecasts based on land use data for their region through extensive processes that emphasizes input from local planners and is done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Table 2-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**46,525**	**49,164**	**51,954**	**54,902**	**56,629**	**58,411**

2.1.2 Land Use

Per the 2013 City of Colton General Plan Land Use Element, 27% of the land within the City of Colton is residential, 4% is commercial, 12% is industrial, 5% is public and institutional, 2% is railroad and utility rights of way, 14% is open space, and 36% is vacant land.

2.2 Water Use

This section describes the current and projected water uses within Colton's service area. Colton serves only potable drinking water.

2.2.1 Water Use by Sector

Colton categorizes its water customers into four categories for the purposes of billing: Residential, Commercial, Municipal, and Sales to Other Agencies. The number of active connections in each category from 2016 to 2020 are shown in **Table 2-2**. Residential connections include both single family and multifamily connections.

Table 2-2: City of Colton 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	8,893	8,918	8,952	8,977	9,003
Commercial	1,060	1,058	1,061	1,052	1,075
Municipal	161	165	165	165	165
TOTAL	**10,114**	**10,141**	**10,178**	**10,194**	**10,243**

2.2.1.1 Past Water Use

Colton's actual water use by customer class from 2016-2020 is shown in **Table 2-3**. Colton's water consumption by customer class in the last five years is shown in **Figure 2-2**.

Approximately 55% of Colton's total deliveries were to residential connections, followed by 42% to commercial customers, and the remainder to municipal customers.

Table 2-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	4,340	4,496	4,928	4,457	4,597
Commercial	3,323	3,4499	3,610	3,421	3,545
Municipal	189	468	99	239	253
Water Losses	1,263	1,255	877	378	849
TOTAL	**9,114**	**9,668**	**9,514**	**8,495**	**9,244**

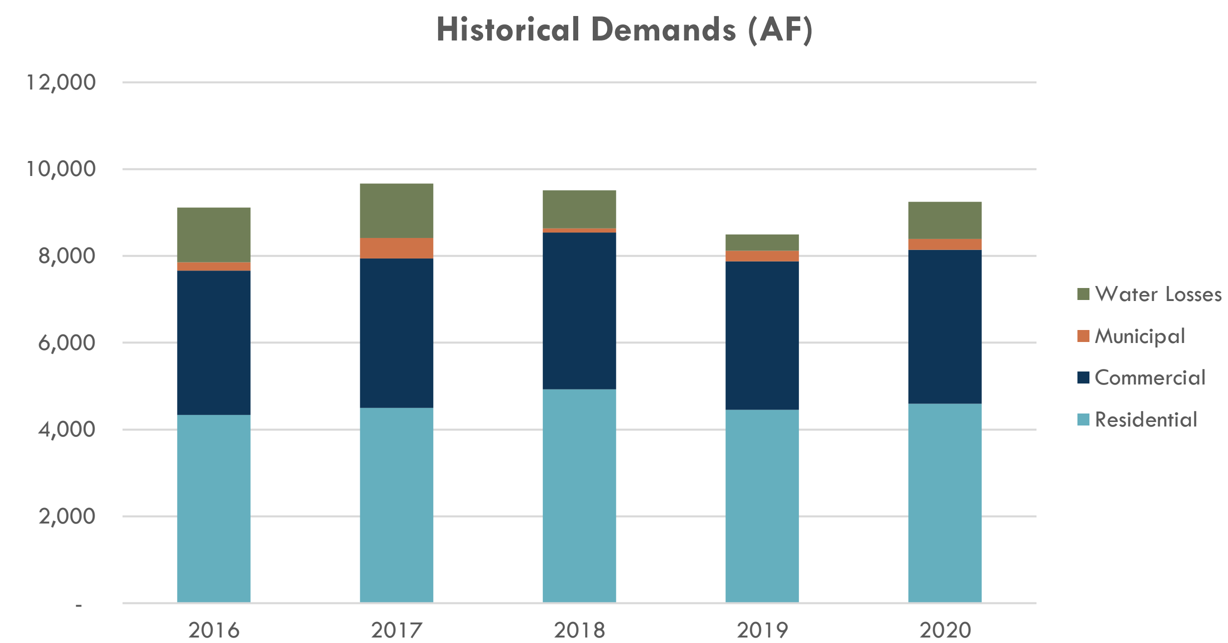


Figure 2-2: City of Colton 2016-2020 Water Consumption by Customer Class

2.2.1.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water.

Sources of water loss include:

- **Leaks from water lines.** Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall water loss. Aging pipes typically have more leaks.

- **Water used for flushing and fire hydrant operations.**
- **Unauthorized uses or theft of water.**
- **Customer Meter Inaccuracies.** Customer meters can under-represent actual consumption in the water system.

Colton monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4 Appendix B-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 2-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020.

Colton will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 2-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS*
1	2016	927
1	2017	1,131
1	2018	577
1	2019	573
1	2020	849 (Estimated)

In the past 5 years, Colton's water loss has ranged from 7% to 13% of water sales. For the purposes of future water use projections, water loss is assumed to be 10%.

Colton is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standard that is being developed by the State Water Board. A discussion of current and planned water loss management measures is included in **Section 2.8.1.5**.

2.2.2 Projected Water Use

A demand forecast tool was developed to estimate future demands based on individual customer categories and connections, with the ability to forecast how future changes in indoor and outdoor water use may impact overall water use within each different customer type for current and future customers.

The tool has three steps to project demand:

1. Establish a demand factor per connection for each customer class based on historical consumption data.
2. Project the number of new connections anticipated for each customer class in each 5-year period after 2020.
3. Modify demand factors as appropriate to account for expected changes in future water use.

The demand factors for each customer class were based on connection and demand data from 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, the demand factor is multiplied by the number of estimated new connections and added to the 2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the total future water use. Projected future demands by customer class are presented in **Table 2-5**, **Table 2-6**, and **Figure 2-3**.

Table 2-5: DWR 4-2R Projected Demands for Water (AF)

	PROJECTED WATER USE				
CUSTOMER CLASS	2025	2030	2035	2040	2045
Residential	4,858	5,119	5,379	5,524	5,669
Commercial	3,746	3,947	4,148	4,260	4,371
Municipal	268	282	296	304	312
Water Loss	887	935	982	1,009	1,035
TOTAL:	**9,759**	**10,283**	**10,806**	**11,097**	**11,388**

Table 2-6: DWR 4-3R Total Gross Water Use (AF)

	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	9,244	9,759	10,283	10,806	11,097	11,388
Recycled Water Demand* From Table 6-4R	-	-	-	-	-	-
TOTAL WATER USE:	**9,244**	**9,759**	**10,283**	**10,806**	**11,097**	**11,388**

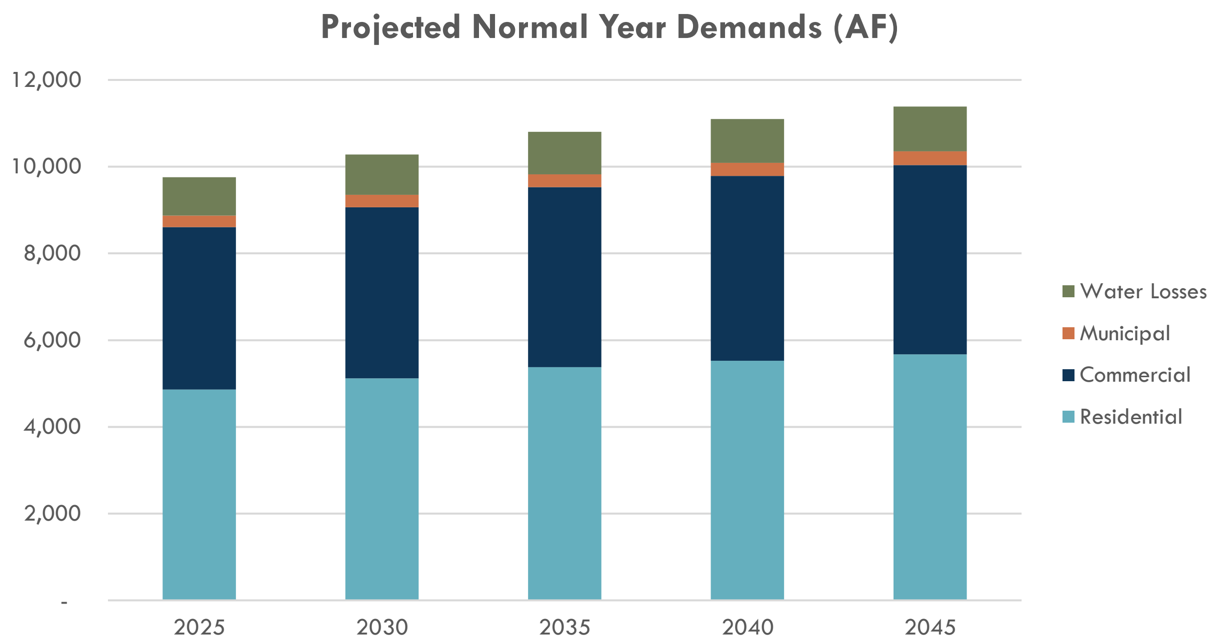


Figure 2-3: City of Colton Projected Future Water Consumption by Customer Class (AF)

2.2.2.1 Estimating Future Water Savings

The demand tool used to project future water use has the capability to modify demand factors for both new and existing connections to quantify reductions in current and future customer demand that may occur as a result of active conservation programs implemented by Colton or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. Colton may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, Colton has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of Colton's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, Colton will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. Colton is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

2.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires water use projections in an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier.

The Colton Water Department serves two jurisdictions: Colton and certain unincorporated areas in the County of San Bernardino. Based on SCAG's 6th cycle final regional housing needs allocation (RHNA), it is estimated that about 37 percent of all Colton households qualify as low income. Water usage by low-income households has been included in future demand projections in **Table 2-5**.

2.2.4 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

2.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets the City developed and demonstrates that compliance by 2020 was achieved.

Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for Colton's calculations are included in **Part 4 Appendix B-7**.

2.3.1 Baseline and Target

Colton's baseline and 2020 target were calculated in the 2015 RUWMP and has not changed for this plan. More details on the development of the baselines and target can be found in the 2015 RUWMP and **Part 4 Appendix B-7**. Colton's calculated water use target for 2020 is 205 GPCD.

2.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, Colton has met its Confirmed Water use Target for 2020 of 205 GPCD, as shown in **Table 2-7**. To maintain this level of water use, Colton intends to continue its current level of outreach and programs for the foreseeable future.

Table 2-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	2020 SUPPLIER ACHIEVED TARGETED REDUCTION
205	177	Yes

2.4 Water Supply

Colton's water supply is comprised entirely of groundwater extracted from the Bunker Hill Basin (part of the San Bernardino Basin Area) the Rialto-Colton Basin, and the Riverside-Arlington Basin (Riverside North Basin portion). Colton does not currently import water in order to meet the demands of its service area. More information about local groundwater basins is included in **Part 1 Chapter 3** of the 2020 IRUWMP.

2.4.1 Purchased or Imported Water

Colton does not currently import water. For the period of this Plan, groundwater pumped by Colton is expected to meet all water supply needs.

2.4.2 Groundwater

Colton extracts groundwater from three adjudicated basins: Bunker Hill (part of the San Bernardino Basin or SBB), Rialto-Colton, and Riverside North Basin Areas. Colton currently utilizes three SBB wells, four Rialto-Colton Basin wells, and one Riverside North Basin well. Colton participates in several ongoing water conservation measures and contributes to regional recharge projects through the SBB Groundwater Council and Rialto Basin Groundwater Council to optimate and enhance the reliability of local groundwater resources. Relevant portions of the adjudications and judgments that govern groundwater use are discussed in Part 1, Chapter 3 of the 2020 IRUWMP.

2.4.2.1 San Bernardino Basin (or SBB, which includes the Bunker Hill Basin)

There are no restrictions on Colton’s extractions from the Bunker Hill Basin except within the Lytle Creek Region and the City of San Bernardino’s groundwater management zone, which restricts new or additional pumping. Restrictions on Colton’s rights from the Bunker Hill Basin are that all the water is to be used within the boundaries of the Valley District.

2.4.2.2 Rialto-Colton

Colton has groundwater extraction rights in the Rialto-Colton Basin. The basin was adjudicated under the 1961 Decree No. 81,264 of the Superior Court of San Bernardino County, and is managed by the Rialto Basin Management Association (stipulated parties of the judgment). When the basin's three index wells' (WVWD Well No. 11 and 13, and Rialto's Well 4) average mean groundwater level elevation is above 1002.3 feet when measured during March, April or May, Colton has no restrictions on yearly extractions. Colton has no restrictions on the rate of pumping per minute or day. When the average standing water level in the three index wells falls below 1002.3 feet msl and is above 969.7 feet msl, Colton is restricted to total groundwater extractions of 3,900 AFY. This extraction right is based on Colton's listed rights in the decree and ownership of wells listed in the decree. The extraction rights listed in the 1961 decree total 15,290 AFY.

When the average of the three index wells drops below 969.7 feet msl, ground water extractions are reduced for all parties stipulated in the decree by 1 percent per foot below the 969.7-foot level, but not to exceed 50-percent reduction. For 2020, the groundwater levels in the index wells led to a 29-percent reduction in allowable production.

Several other entities also withdraw water from the Rialto Basin. The Fontana Union Water Company (FUWC) has one well located within the basin, but was omitted from the adjudication decree. In 2018, Colton, Valley District, FUWC and Cucamonga Valley Water District entered into a Settlement Agreement that resulted in FUWCs No Man's Land production of 5,014 acre feet/year will being counted as part of the Rialto Basin production limits in the 1961 decree. These parties also agreed to form a Rialto Basin Groundwater Council (Rialto Basin GC), which was formed in 2021. The Rialto Basin GC will develop, adopt, and implement a sustainable groundwater management plan, which will include implementing groundwater recharge projects to restore groundwater levels.

Colton has a total water right allocation in the Rialto Basin of 3,900 AFY, including 890 AFY that are fixed rights and 3,010 AFY that are adjustable and subject to a percent reduction each year based on groundwater levels in the index wells. Over the previous 10 years, the average percent reduction has been nearly 30 percent, and was 29 percent in 2020. For the purposes of this plan, Colton and the other agencies who pump from the Rialto Basin are assuming a 30-percent reduction in adjustable rights in 2025 and a 2% gain in adjustable rights for every 5-year period thereafter based on planned recharge to increase water levels and adjustable rights.

> For 2025, Colton's average water supply from the Rialto Basin is expected to be 2,997 AFY (890 AFY fixed plus 3,010 AFY reduced by 30 percent). By 2045, the average water supply is assumed to increase to 3,238 AFY.

The City of Colton's historical production for the past five years is shown in **Table 2-8**.

Table 2-8. DWR 6-1R Groundwater Volume Pumped (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Bunker Hill (part of SBB)	3,022	3,930	3,698	2,944	2,623
Alluvial Basin	Rialto-Colton	2,485	1,983	1,931	1,943	2,899
Alluvial Basin	Riverside-Arlington (North)	3,607	3,755	3,985	3,708	3,722
	TOTAL:	**9,114**	**9,668**	**9,614**	**8,595**	**9,244**

2.4.3 Surface Water

Colton currently has no plans for future use of surface water supplies.

2.4.4 Stormwater

Colton is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the basins Colton produces water from. These regional projects are discussed in **Chapter 3**.

2.4.5 Wastewater and Recycled Water

The City of Colton owns, operates, and maintains a wastewater collection, pumping and treatment system. The wastewater treatment plant also serves the City of Grand Terrace and unincorporated San Bernardino County areas. The plant utilizes a conventional and extended aeration secondary treatment process to product treated effluent in compliance with Regional Water Quality Control Board regulations.

Treated effluent from Colton's wastewater treatment plant is conveyed to the Rapid Infiltration-Extraction (RIX) facility, which Colton jointly owns with SBMWD. The RIX facility treats a combined secondary-treated effluent stream of approximately 5 million gallons per day (MGD) from Colton's WWTP and 20 MGD from the San Bernardino Water Reclamation Plant to tertiary standards. The RIX facility utilizes natural biofiltration through the use of percolation basins, followed by an ultraviolet disinfection system. All of the RIX-treated water is discharged to the Santa Ana River.

> It is estimated that approximately 73% or 3.7 MGD of the wastewater collected at the City of Colton WWTP was generated within Colton's water service area in 2020.

Information about wastewater collected and treated is presented in **Table 2-9** and **Table 2-10**.

Table 2-9. DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
City of Colton	Metered	4,092	City of Colton	Colton Water Reclamation Facility	Yes	No
	TOTAL:	**4,092**				

Table 2-10. DWR 6-3R Wastewater Treatment and Discharge within Service Area in 2020 (AF)

-							2020 VOLUMES				
WASTEWATER TREATMENT PLANT NAME	DISCHARGE LOCATION NAME OR IDENTIFIER	DISCHARGE LOCATION DESCRIPTION	WASTEWATER DISCHARGE ID NUMBER	METHOD OF DISPOSAL	PLANT TREATS WASTEWATER GENERATED OUTSIDE THE SERVICE AREA	TREATMENT LEVEL	WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIREMENT
Colton Water Reclamation Facility	Rapid Infiltration/Extraction (RIX) Plant	to RIX for additional treatment		Other	Yes	Secondary, Disinfected - 2.2	5,627	5,627			
RIX		Santa Ana River		River of creek outfall	Yes	Tertiary	29,816	29,816			
						TOTAL:	**35,443**	**35,443**	**-**	**-**	**-**

2.4.5.1 Potential, Current, and Projected Recycled Water Uses

No recycled water is currently used in the Colton service area. Construction of such facilities is cost prohibitive at this time and no recycled water use is anticipated during the period covered by this Plan. More information about the regional approach for utilizing recycled water for direct use and meeting habitat needs in the Santa Ana River is presented in **Part 1 Chapter 3**.

2.4.6 Water Exchanges and Transfers

Colton does not anticipate regular or long-term transfers or exchanges, during the period covered by this Plan. Any transfer or exchanges would be as-needed related to an emergency.

2.4.6.1 Emergency Interties

Colton has two emergency water system connections with the City of San Bernardino (1,000 GPM and 800 GPM); one with the City of Riverside (800 GPM); two with Riverside Highland Water Company (1,000 GPM and 800 GPM), and one with WVWD (1,500 GPM).

2.4.6.2 Future Water Projects

The City recently completed a Water Master Plan to identify necessary upgrades to its water distribution system. These projects are intended to increase the reliability of the City's system; they are not intended to create new sources of supply. The City recently completed Well 30 in the Riverside North Basin. Well 31, also in the Riverside North Basin, has been drilled but has not yet been outfitted.

2.4.7 Summary of Existing and Planned Sources of Water

Colton's water supply is comprised entirely of groundwater extracted from the San Bernardino Basin Area (Bunker Hill Basin portion), the Rialto-Colton Basin, and the Riverside-Arlington Basin (Riverside North Basin portion). This same mix of supplies is anticipated to be used in the future.

The volume of water utilized from each source in 2020 is summarized in **Table 2-11** and projected supply by source is summarized in **Table 2-12**.

Table 2-11. DWR 6-8R Actual Water Supplies in 2020 (AF)

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2020 ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	Bunker Hill (part of SBB)	2,623	Drinking Water	See Note
Groundwater (not desalinated)	Rialto-Colton	2,899	Drinking Water	See Note
Groundwater (not desalinated)	Riverside North	3,722	Drinking Water	See Note
	TOTAL:	**9,244**		**-**

See Part 1, Chapter 3 for discussion of safe yield of regional groundwater basins

Table 2-12. DWR 6-9R Projected Water Supplies (AF)

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	PROJECTED WATER SUPPLY 2025 REASONABLY AVAILABLE VOLUME		2030 REASONABLY AVAILABLE VOLUME		2035 REASONABLY AVAILABLE VOLUME		2040 REASONABLY AVAILABLE VOLUME		2045 REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	Bunker Hill (part of SBB)	4,425		4,968		5,510		5,784		6,058
Groundwater (not desalinated)	Rialto-Colton	2,800		2,800		2,800		2,801		2,802
Groundwater (not desalinated)	Riverside-Arlington	3,800		3,800		3,800		3,800		3,800
Purchased or Imported Water	State Water Project - Rialto Colton Groundwater Supplemental Supply	197		257		317		377		436
	TOTAL:	**11,222**	**-**	**11,825**	**-**	**12,427**	**-**	**12,762**	**-**	**13,096**

Supplies shown in this table are planned pumping or diversions, except supplies from San Bernardino Basin are increased to meet the Total Supply Target with 15% Reliability Factor.

Table 2-13. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	11,222	11,825	12,427	12,762	13,096
Demand Totals From Table 4-3R	9,759	10,283	10,806	11,097	11,388
DIFFERENCE:	**1,463**	**1,542**	**1,621**	**1,665**	**1,708**

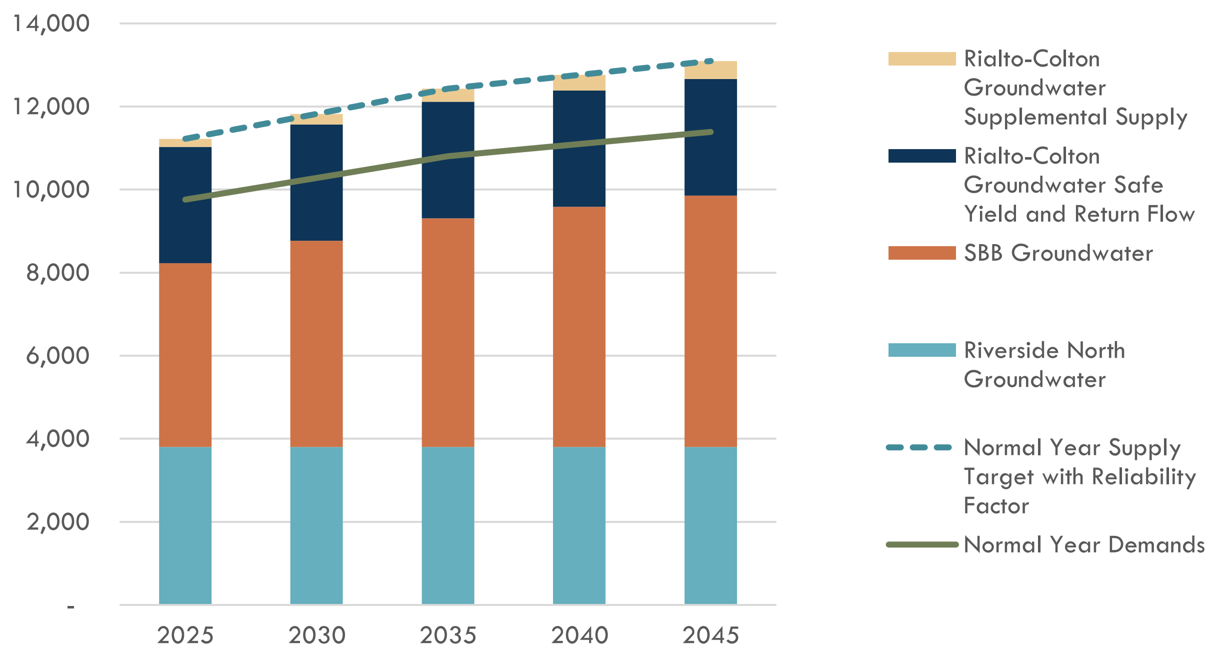


Figure 2-4: City of Colton Projected Supply and Demand Comparison (AF)

2.4.8 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

Colton has two major contributors to water facility energy consumption: well consumption and water treatment. The energy consumption for each of these processes in 2019 are as follows:

- Well Production = 4,562,560 kWh
- Water Treatment = 4,898,000 kWh

In 2019, Colton consumed a total of 9,460,560 kWh of energy for water facilities, for an energy intensity of 1,114 kWh per AF.

2.5 Water Service Reliability Assessment

This section considers Colton's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from Colton's current source of supply through 2045.

2.5.1 Constraints on Water Sources

Perchlorate was first detected in Colton's water supply wells in the Rialto-Colton Basin (RCB) in 1997. Colton evaluated best available treatment technologies for perchlorate, and two ion exchange treatment systems were installed in 2003 to treat water from three wells (Colton -15, -17 and -24). These systems are still in use.

Ongoing investigations by Colton and others in 2009 and 2010 have shown that the perchlorate plume persists. Until basin-wide efforts are implemented by the responsible parties to remediate the perchlorate, Colton will continue to use wellhead treatment systems.

Based on current conditions, water quality is not expected to affect Colton's supply reliability. However, water quality issues are constantly evolving. Colton will take action to protect and treat supplies when needed, though water quality treatment is known to have significant costs.

2.5.2 Year Type Characterization

In general, groundwater is 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 BTAC, monitor groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in **Part 1 Chapter 3**.

Per UWMP requirements, Colton has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition 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.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

2.5.3 Water Service Reliability

The results of the reliability assessment are summarized in the tables below.

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. 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% increase throughout the 5-year drought to be conservative.

As described in **Part 1 Chapter 3**, the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. Colton is able to pump additional groundwater from Bunker Hill and Riverside North to meet increased demands in dry years and participates in efforts to replenish the basins with imported and local water through regional recharge programs. Colton's groundwater supplies are not reduced in dry years so 2020 is considered the base year for all year types. Based on the analysis, Colton does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, Colton participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. Colton also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 2-14**. The percent of average supply increases in drought years because Colton's groundwater production will increase to meet an assumed increase in demands.

Table 2-14. Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS AS PERCENT OF AVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a normal year are shown in **Table 2-13**.

The projected supply and demand during a single dry year are shown in **Table 2-15**. Colton's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basins Colton produces water from have storage for use in dry years so Colton can produce the volume of water needed to meet 100% of demands in single dry years. Colton's supplies are 100% reliable during single dry years.

Table 2-15. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

-	2025	2030	2035	2040	2045
Supply Totals	12,345	13,007	13,670	14,038	14,405
Demand Totals	10,734	11,311	11,887	12,207	12,526
DIFFERENCE:	**1,610**	**1,697**	**1,783**	**1,831**	**1,879**

The projected supply and demand during five consecutive dry years are shown in **Table 2-16**. Colton's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins Colton produces water from have storage for use in dry years so Colton can produce the volume of water needed to meet 100% of demands in multiple dry years. Colton's supplies are 100% reliable during multiple dry years.

Table 2-16. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
First Year	Supply Totals	12,345	13,007	13,670	14,038	14,405
	Demand Totals	10,734	11,311	11,887	12,207	12,526
	DIFFERENCE:	**1,610**	**1,697**	**1,783**	**1,831**	**1,879**
Second Year	Supply Totals	12,345	13,007	13,670	14,038	14,405
	Demand Totals	10,734	11,311	11,887	12,207	12,526
	DIFFERENCE:	**1,610**	**1,697**	**1,783**	**1,831**	**1,879**
Third Year	Supply Totals	12,345	13,007	13,670	14,038	14,405
	Demand Totals	10,734	11,311	11,887	12,207	12,526
	DIFFERENCE:	**1,610**	**1,697**	**1,783**	**1,831**	**1,879**
Fourth Year	Supply Totals	12,345	13,007	13,670	14,038	14,405
	Demand Totals	10,734	11,311	11,887	12,207	12,526
	DIFFERENCE:	**1,610**	**1,697**	**1,783**	**1,831**	**1,879**
Fifth Year	Supply Totals	12,345	13,007	13,670	14,038	14,405
	Demand Totals	10,734	11,311	11,887	12,207	12,526
	DIFFERENCE	**1,610**	**1,697**	**1,783**	**1,831**	**1,879**

2.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because Colton has access to groundwater basins with significant storage, total available supplies do not vary on a monthly or seasonal basis, so this analysis is conducted on an annual basis. Projected demands and supplies from 2021-2025 are shown in **Table 2-17**.

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. This DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in Section 2.5 and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for Colton. Colton can produce additional groundwater to meet any increases in demand in dry years.

As shown in **Part 1 Chapter 5**, the region as a whole has sufficient supplies to meet demands plus the 15% Reliability Factor, even in a 5-year drought. As shown in **Part 1 Chapter 5 Figure 5-1**, the SBB had over 4.8 million acre-feet in storage as of 2020 due to regional efforts to store water in wet years for use during dry years.

> Although projections in this Plan show that the regional water supplies are sufficient to meet the demands of Colton and the Region as a whole, even during a 5-year drought (see Part 1 Chapter 5), Colton remains committed to water conservation and to being a good steward of regional water resources to preserve supplies for the future due to the possibility of experiencing more severe droughts than anticipated in this Plan.

Table 2-17: Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	10,282
	Total Supplies	11,824
	SURPLUS	**1,542**
2022	Gross Water Use	10,395
	Total Supplies	11,954
	SURPLUS	**1,559**
2023	Gross Water Use	10,508
	Total Supplies	12,084
	SURPLUS	**1,576**
2024	Gross Water Use	10,621
	Total Supplies	12,214
	SURPLUS	**1,593**
2025	Gross Water Use	10,734
	Total Supplies	12,345
	SURPLUS	**1,610**

2.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that Colton 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 a number of reasons, such as water supply 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 Colton 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 Colton maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

> The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. Colton's WSCP is attached as Part 4 Appendix B-9.

2.8 Demand Management Measures

The City of Colton is committed to an effective water conservation program and has had a program in place since 1997. The Demand Management Measures (DMM) section provides a comprehensive description of the water conservation programs that Colton has implemented for the past five years, is currently implementing, and plans to implement in order to maintain reliability of groundwater supplies.

2.8.1 Existing Demand Management Measures

Consistent with the requirements of the CWC, this section describes the required demand measurement measures (DMM) that have been implemented in the past five years and will continue to be implemented into the future.

2.8.1.1 Water Waste Prevention Ordinances

Colton supports measures prohibiting gutter flooding, single-pass cooling systems in new connections, non-recirculating systems in all new conveyor car wash and commercial laundry systems, and nonrecycling decorative water fountains. As part of their 2010 UWMP, Colton prepared a draft no-waste ordinance, An Ordinance of the City Council of the City of Colton Prohibiting the Wasteful Use of Water and Setting Forth Regulations and Restrictions on Water Use.

Colton has full authority to adopt and enforce ordinances through their municipal codes. The no-waste ordinance was adopted in September of 2014 and updated in June of 2015 (both attached in Part 4, Appendix B-9). Colton will enforce the no-waste ordinance, including responding to reported or observed violations and educating and assisting the user in corrective action.

2.8.1.2 Metering

All of Colton's customers (residential and commercial) are metered, as are all new connections. All customers are billed with commodity rates. Colton has a meter maintenance and replacement plan where meters are replaced either when they fail or every 10 years.

2.8.1.3 Conservation Pricing

Colton bills all domestic water accounts volumetrically, per 100 cubic feet of use, plus a monthly service based on meter size. Based on the ratio of volumetric to total charges over the past five years.

2.8.1.4 Public Education and Outreach

The public information program encourages Colton's customers to conserve water and provides a means by which customers can measure the effectiveness of water conservation efforts.

Specific program components include:

- Informational pamphlets on landscaping using water efficient methods for distribution with utility bills;
- Current water bills show the current months versus the past few months. The City of Colton is looking to change this to show the same month in the last several years;
- Distribution of pamphlets which include specific conservation practices; facts concerning state, local, residential, and individual water consumption statistics; and waste statistics;
- Colton is working to get a web based water conservation tool in place that shows usage comparisons, and provide monthly reports; and
- Providing water conservation information on public access television (Channel 3) and postings on social media at Colton Public Utilities Facebook and Twitter pages.
- The City is working to coordinate school visits where possible and will visit should a school/teacher reach out utilizing Project WET curriculum.
- The Water Conservation division coordinates with customers using Flume technology to identify possible leaks in the home or outdoors.
- Providing education on the City's website https://www.ci.colton.ca.us/515/Conservation
- Participates in the City's annual community earth day event educating the public on water efficiency efforts

2.8.1.5 Programs to Assess and Manage Distribution System Water Loss

Colton plans to implement the standard water audit approach per Manual 36. The AWWA water audit methodology will be performed annually and losses carefully monitored. To date, Colton has been conducting system water audits, leak detection and repair as necessary in order to maintain its distribution system. Meters that are 2 inches or less are repaired or replaced as-needed, if found to be operating incorrectly. Defective meters are usually found by the meter reader or by the customer service department, which reviews consumption histories. Colton maintains a complete record and map of distribution system leaks and repairs. Analysis of this record allows pipelines and other facilities to be scheduled for replacement as part of Colton's capital improvement program. Most of the older, steel water mains throughout Colton have been replaced, greatly reducing the incidence of leaks within the distribution system. Maintenance crews are on call at all times to respond to water leaks, pipeline ruptures, and damaged facilities as needed. Continued implementation of water loss control practices and procedures is not anticipated to have an effect on Colton's ability to further reduce demand.

Colton is looking into developing a program to perform water audits in conjunction with electrical audits.

2.8.1.6 Water Conservation Program Coordination and Staffing Support

In 2013 a Water Conservation Specialist was hired and in 2015 they were promoted to Senior Water Conservation Specialist. In 2019, the City also hired Management Interns to assist in water waste reporting.

2.8.1.7 Other Demand Management Measures

All building codes are up to date and the City of Colton offers rebates for: high efficiency toilets, dishwashers, washing machines, shower heads, sprinkler heads, weather based irrigation timers, drought tolerant plants, drip irrigation systems, and mulch. We also offer a turf removal incentive. The rebate amounts are considered on a case by case basis. This means that, for example, if a customer applies for a rebate for 30 toilets, we would assess our budget to see if we can provide them a $100 rebate for all 30 toilets. The same "formula" would apply for all rebates except the outdoor. Commercial Customers can apply for up to $5000 for turf, and up to $2500 for drought tolerant plants, drip, and mulch combined.

> Colton is in the planning phase for direct install program of efficient fixtures for multi-family properties. As well as a program where a contractor will remove grass lawns or landscapes and plant drought tolerant landscaping for commercial properties. Colton is also in the process of installing City wide weather controlled smart irrigation controllers for all City owned landscape maintenance areas including parks and medians.

2.9 Adoption, Submittal and Implementation

This section describes Colton's process for adopting, submitting, and implementing the 2020 IRUWMP and Colton's WSCP.

2.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared.   This notice was sent at least 60 days prior to Colton's public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within Colton's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

> Colton provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in Part 4 Appendix B-2.

2.9.2 Public Hearing and Adoption

Colton held a public hearing on June 15, 2021 to hear public comment and consider adopting this 2020 IRUWMP and Colton's WSCP.

As part of the public hearing, the Colton provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed Colton the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

> Colton's adoption resolution for the 2020 IRUWMP and Colton's WSCP is included in Part 4 Appendix B-3.

2.9.3 Plan Submittal

Colton will submit the 2020 IRUWMP and Colton's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption.

> 2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

2.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, Colton will make the plan available for public review during normal business hours by placing a copy of the 2020 IRUWMP and Colton's WSCP at the front desk of the City's office, and by posting the plans on the City's website for public viewing.

2.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or Colton's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

CITY OF LOMA LINDA

2020 IRUWMP

Part 2 Chapter 3

Loma Linda UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

WSC

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

3

RETAIL URBAN WATER MANAGEMENT PLAN

City of Loma Linda

This chapter describes information specific to the City of Loma Linda its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the City of Loma Linda's reporting requirements for 2020 under the UWMP Act.

3.1 System Description

The City of Loma Linda Water Department (Loma Linda) is the municipally owned utility that provides potable water at retail to customers within the city limit of Loma Linda. Loma Linda is a retail public water supplier that meets the definition of an urban water supplier with over 5,700 municipal water service connections in 2020.

The City of Loma Linda was incorporated in 1970 and is bounded by the South Hills to the south, the City of Redlands to the east, the City of San Bernardino to the North, the City of Colton to the northwest, and the City of Grand Terrace to the southwest. The City is part of the greater San Bernardino-Ontario metropolitan area.

The water service area has an area of approximately 6,784 acres, or 10.6 square miles, lies entirely within the boundaries of the Valley District service area.

Loma Linda University and Loma Linda University Medical Center are located within the limits of the City but have their own water production and distribution system. With the exception of fire flow, the City does not provide water service to the University on a normal basis. However, the City is the water provider for other large institutional users including the 205-bed Veterans Administration Hospital and the Loma Linda Community Hospital.

The service area is shown in **Figure 3-1.**

IN THIS SECTION

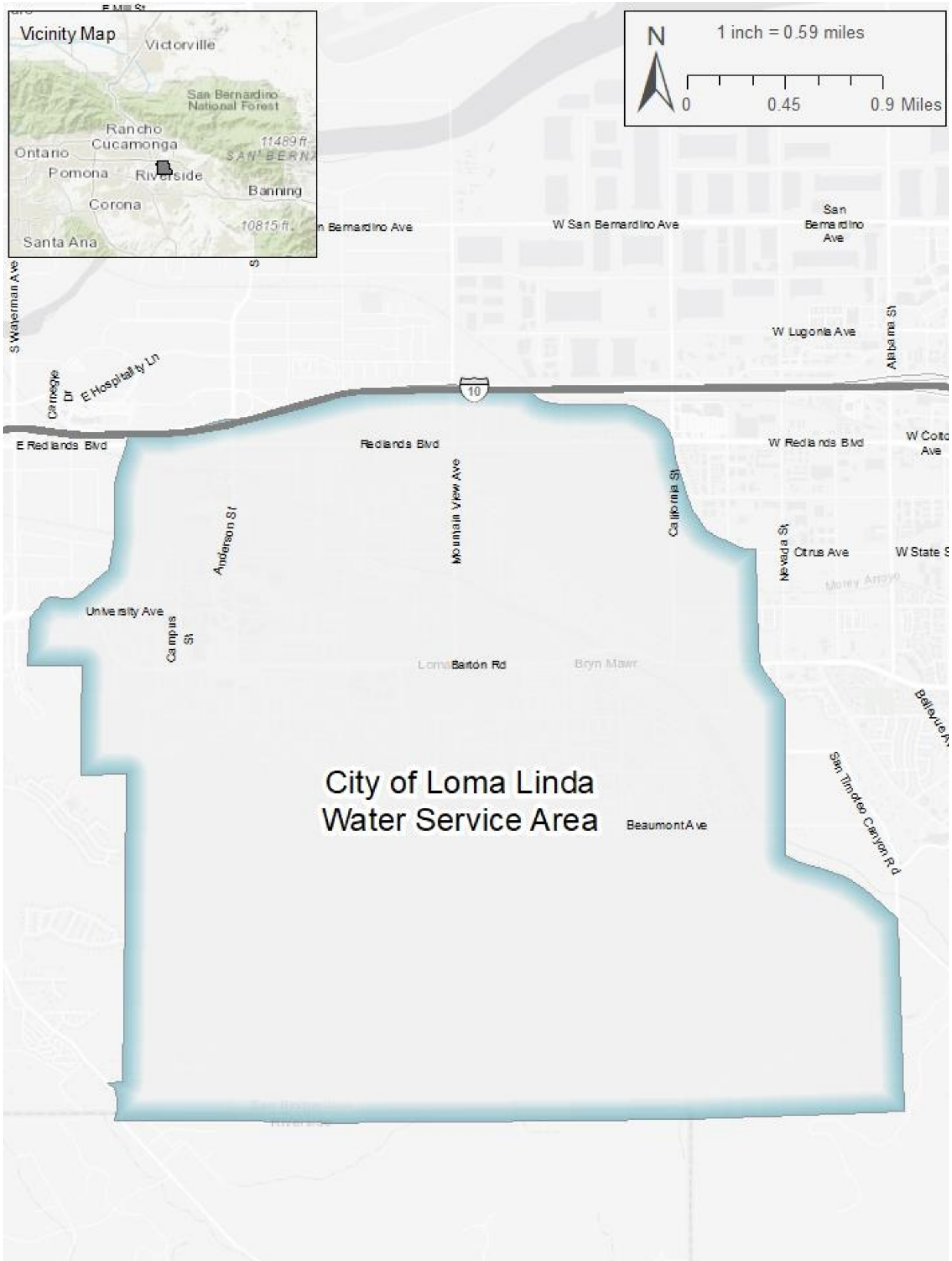


Figure 3-1: City of Loma Linda Water Service Area Map

The regional climate, which includes Loma Linda's service area, is described in **Part 1 Chapter 2** of the 2020 IRUWMP.

3.1.1 Population

For the purposes of consistent reporting of population estimates, the California Department of Water Resources (DWR) has developed a GIS-based tool (DWR Tool) to estimate the population within a water agency's service area using census data and number of water service connections. The DWR Tool was used to intersect the service area boundary with census data to provide population estimates for 1990, 2000, and 2010. The DWR Tool uses the number of service connections in those prior census years, where available, to calculate a persons-per-connection factor, which is then projected forward to estimate population in a given year using the number of connections in that year. The service area population for 2020 was estimated in the DWR Tool using the number of connections in 2010 and 2020.

To estimate population for future years, projections from the Southern California Association of Governments (SCAG) were used. SCAG has developed a forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and in 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. The service area boundary was intersected with a GIS shapefile of the SCAG TAZs to provide an estimate of population within the service area for years 2020, 2035, and 2045. These estimates were used to calculate compound annual population growth rates for years 2020-2035 and 2035-2045. The population growth rates were applied to the 2020 population to estimate future population. Estimated 2020 and future year population is shown in **Table 3-1**. The 2025 population was adjusted upwards to account for known developments planned for construction by 2025, and all subsequent population projections were based on the 2025 population projection.

Per SCAG requirements, it must be noted that this population modeling analysis was performed by Water Systems Consulting, Inc. based upon modeling information originally developed by SCAG. SCAG is not responsible for how the model is applied or for any changes to the model scripts, model parameters, or model input data. The resulting modeling data does not necessarily reflect the official views or policies of SCAG. SCAG shall not be held responsible for the modeling results and the content of the documentation.

SCAG prepares demographic forecasts based on land use data for their region through extensive processes that emphasizes input from local planners and is done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Table 3-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**24,325**	**25,495**	**26,300**	**27,130**	**27,949**	**28,792**

3.1.2 Land Use

Per the 2009 City of Loma Linda General Plan, 63% of land is undeveloped, including open space, agricultural use, recreational use, or vacant land. The remaining land use is a mixture of urban uses, including 14% single family residential, 10% multifamily residential, 3% commercial, 9% institutional, and 0.5% industrial.

3.2 Water Use

This section describes the current and projected water uses within Loma Linda's service area. Loma Linda serves only potable drinking water.

3.2.1 Water Use by Sector

Loma Linda categorizes its water customers into four categories: Single Family Residential, Multi-Family, Commercial/Institutional, and Landscape Irrigation. The number of active connections in each category from 2016 to 2020 are shown in **Table 3-2**, as well as the standard DWR use type most closely associate with the category. Landscape Irrigation connections include parks, large commercial, community, and institutional landscape areas, and school landscape areas. Commercial/Institutional connections include all non-residential and non-landscape irrigation connections.

Table 3-2: City of Loma Linda 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Single Family Residential	4,505	4,585	4,565	4,594	4,794
Multi-Family	385	382	402	387	387
Commercial/Institutional	279	275	327	350	283
Landscape Irrigation	254	205	185	261	261
TOTAL	**5,423**	**5,447**	**5,479**	**5,592**	**5,726**

3.2.1.1 Past Water Use

Loma Linda's actual water use by customer class from 2016-2020 is shown in **Table 3-3.** Loma Linda's water consumption by customer class in the last five years is shown in **Figure 3-2**. Approximately 51% of Loma Linda's total deliveries were to single family residences, followed by 19% to landscape irrigation, 17% to multi-family services, and 13% commercial/institutional services.

Table 3-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Single Family Residential	2,210	2,220	2,390	2,069	2,406
Multi-Family	790	757	759	686	829
Commercial/Institutional	524	567	576	608	603
Landscape Irrigation	728	800	929	783	918
Water Loss	461	737	508	582	436
TOTAL	**4,713**	**5,061**	**5,162**	**4,729**	**5,192**

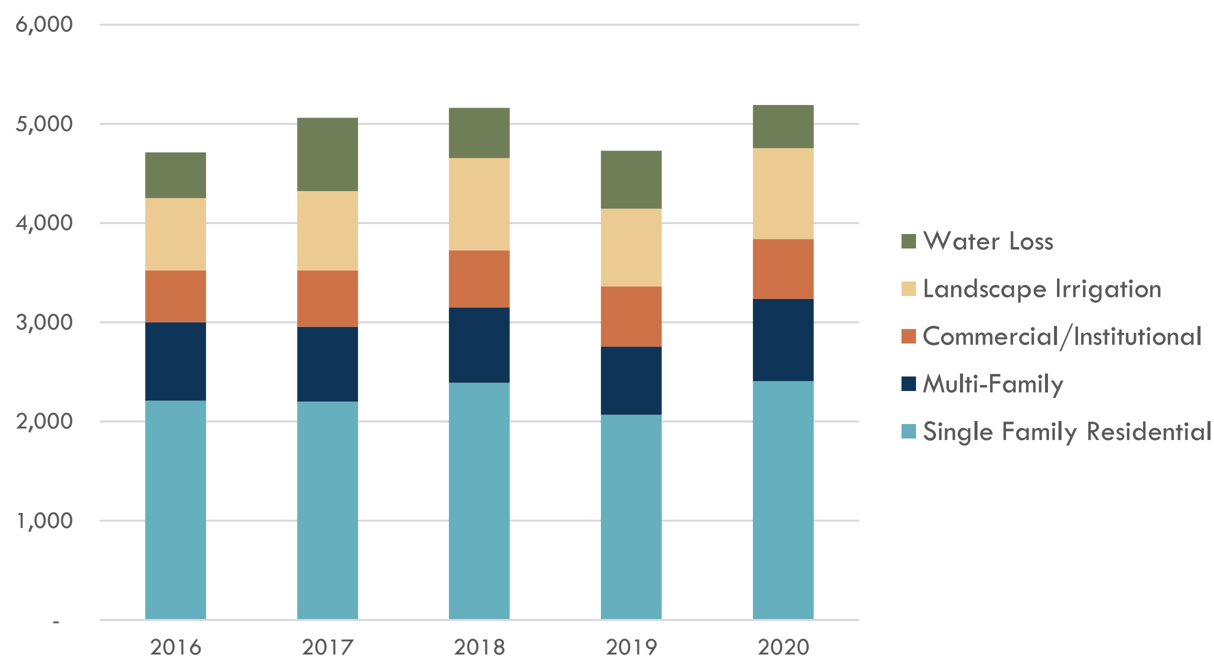


Figure 3-2: City of Loma Linda 2016-2020 Water Consumption by Customer Class (AF)

3.2.1.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water.

Sources of water loss include:

- **Leaks from water lines.** Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall water loss. Aging pipes typically have more leaks.

- **Water used for flushing and fire hydrant operations.**
- **Unauthorized uses or theft of water.**
- **Customer Meter Inaccuracies.** Customer meters can under-represent actual consumption in the water system.

Loma Linda monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4 Appendix C-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 3-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020.

Loma Linda will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 3-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS*
1	2016	173
1	2017	674
1	2018	517
1	2019	538
1	2020	436 (Estimate)

In the past 5 years, Loma Linda's water loss has ranged from 4-17% of water sales. For the purposes of future water use projections, water loss is assumed to be 13% of projected water sales.

Loma Linda is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standard that is being developed by the State Water Board. A discussion of current and planned programs to manage water loss are included in **Section 3.8.1.5.** These programs will increase the efficiency of the water distribution system by decreasing future water losses; however, water losses cannot be prevented entirely.

3.2.2 Projected Water Use

A demand forecast tool was developed to estimate future demands based on individual customer categories and connections, with the ability to forecast how future changes in indoor and outdoor water use may impact overall water use within each different customer type for current and future customers.

The tool has three steps to project demand:

1. Establish a demand factor per connection for each customer class based on historical consumption data.
2. Project the number of new connections anticipated for each customer class in each 5-year period after 2020.
3. Modify demand factors as appropriate to account for expected changes in future water use.

The demand factors for each customer class were based on connection and demand data from 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.

In the period from 2020 to 2025, the SCAG population growth rate projected that 151 new single family residential connections would be constructed. However, Loma Linda anticipates that 300 new single family residential connections will likely be constructed by 2025 based on known developments. To account for known developments, it was assumed that 300 new single family residential connections would be constructed by 2025 and 151 new single family residential connections would be constructed in each 5-year period thereafter. Connection growth for all other customer types was set equal to the SCAG population growth rate for the period 2020 through 2045.

To estimate future water use for each customer category, the demand factor is multiplied by the number of estimated new connections and added to the 2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the total future water use. Projected future demands by customer class as well as estimated losses are presented in **Table 3-5**, **Table 3-6,** and **Figure 3-3.**

Table 3-5: DWR 4-2R Projected Demands for Water (AF)

	PROJECTED WATER USE				
CUSTOMER CLASS	2025	2030	2035	2040	2045
Single Family Residential	2,557	2,633	2,708	2,781	2,854
Multi-Family	855	881	907	933	958
Commercial/Institutional	622	641	660	678	696
Landscape Irrigation	947	976	1,005	1,033	1,060
Water Loss	647	667	687	705	724
TOTAL:	**5,628**	**5,798**	**5,968**	**6,130**	**6,292**

Table 3-6: DWR 4-3R Total Gross Water Use (AF)

	2020	2020	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	5,192	5,628	5,798	5,968	6,130	6,292
Recycled Water Demand* From Table 6-4R	-	-	-	-	-	-
TOTAL WATER USE:	**5,192**	**5,628**	**5,798**	**5,968**	**6,130**	**6,292**

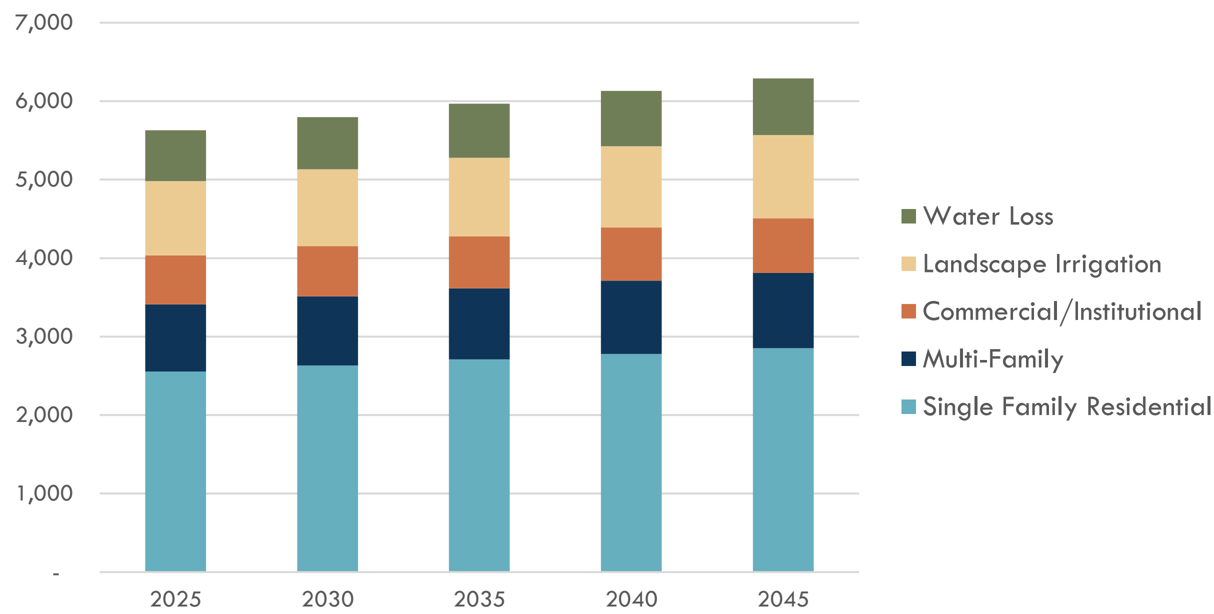


Figure 3-3: City of Loma Linda Projected Future Water Consumption by Customer Class (AF)

3.2.2.1 Estimating Future Water Savings

The demand tool used to project future water use has the capability to modify demand factors for both new and existing connections to quantify reductions in current and future customer demand that may occur as a result of active conservation programs implemented by Loma Linda or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. Loma Linda may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, Loma Linda has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of Loma Linda's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, Loma Linda will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. The City of Loma Linda is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

3.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires water use projections in an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier.

The Loma Linda Water Department serves water only within the jurisdiction of the City of Loma Linda. Based on SCAG's 6th cycle final regional housing needs allocation (RHNA), it is estimated that about 41 percent of all Loma Linda households qualify as low-income or very low-income. Water usage by low-income households has been included in the future demand projections.

3.2.4 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

3.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets the City developed and demonstrates that compliance by 2020 was achieved.

Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for Loma Linda's calculations are included in **Part 4, Appendix C-7.**

3.3.1 Baseline and Target

Loma Linda's baseline and 2020 target was calculated in the 2015 RUWMP and has not changed for this plan. More details on the development of the baselines and target can be found in the 2015 RUWMP and **Part 4, Appendix C-7**. Loma Linda's calculated water use target for 2020 is 194 GPCD.

3.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of water conservation programs, Loma Linda has met its Confirmed Water use Target for 2020 of 194 GPCD, as shown in **Table 3-7**. To maintain this level of water use, Loma Linda intends to continue its current level of outreach and programs for the foreseeable future.

Table 3-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
194	191	Yes

3.4 Water Supply

Loma Linda's water supply is comprised entirely of groundwater from the Bunker Hill Basin (part of the San Bernardino Basin or SBB). More information about the SBB groundwater basin is included in **Part 1 Chapter 3** of the 2020 IRUWMP.

3.4.1 Purchased or Imported Water

Loma Linda maintains two emergency interties with the City of San Bernardino. The pumps at these interties are tested monthly for a short period of time, delivering a small amount (1 – 2 AFY) of water into Loma Linda's system. This supply source is not listed in future supply projections. Furthermore, Loma Linda does not anticipate using SWP water as a water supply source in the future.

3.4.2 Groundwater

Loma Linda's sole source of water is groundwater extracted from the Bunker Hill Basin. The City has seven groundwater wells, one of which is offline due to high fluoride levels. Of the six operable wells, Loma Linda currently operates five wells, ranging in capacity from 1,000 to 3,300 gallons per minute (gpm). The sixth well has a capacity 1,500 gpm, but is typically not used because of the additional cost of operating a wellhead treatment system to remove arsenic. The total capacity of Loma Linda's six operable wells is 12,600 gpm.

3.4.3 Surface Water

The City of Loma Linda owns 1,020 shares of Bear Valley Mutual Water Company. The City Parks Department takes delivery of 1 – 2 AFY of surface water from the Santa Ana River and irrigates City parks through a small raw water distribution system. This system is managed and operated separately from the City of Loma Linda Water Department and is not included in this analysis.

3.4.4 Stormwater

Loma Linda is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the SBB. These regional projects are discussed in **Part 1 Chapter 3.**

3.4.5 Wastewater and Recycled Water

Loma Linda owns and operates a wastewater collection system and provides sewer line maintenance and collection services to its customers. Wastewater treatment services are provided under provisions outlined in a Joint Powers Agreement (JPA) with the City of San Bernardino.

Wastewater from the Loma Linda service area is treated to secondary levels at the San Bernardino Water Reclamation Plant and to tertiary levels at the RIX Plant. The RIX facility treats a combined secondary-treated effluent stream of approximately 5 MGD from Colton's WWTP and 20 MGD from the San Bernardino Water Reclamation Plant to tertiary standards. The RIX facility utilizes natural biofiltration through the use of percolation basins, followed by an ultraviolet disinfection system. All of the RIX-treated water is discharged to the Santa Ana River.

> It is estimated that approximately 11% or 2 MGD of the wastewater collected at the San Bernardino Water Reclamation Plant was generated within Loma Linda’s water service area in 2020.

Information about wastewater collected is presented in **Table 3-8**.

3.4.5.1 Potential, Current, and Projected Recycled Water Uses

There is an active planning process to use RIX discharge for direct groundwater recharge and non-potable demands. However, the location of the plant makes providing water to customers upstream of the plant (e.g., Loma Linda) cost-prohibitive. More information about the regional approach for utilizing recycled water for direct use and meeting habitat needs in the Santa Ana River is presented in **Part 1 Chapter 3.4**.

Table 3-8. DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
City of Loma Linda	Metered	2,556	City of San Bernardino	San Bernardino Water Reclamation Plant (WRP)	No	No
	TOTAL:	**2,556**				

3.4.6 Water Exchanges and Transfers

Loma Linda does not anticipate regular or long-term transfers or exchanges during the period covered by this Plan. Any transfer or exchanges would be as-needed related to an emergency.

3.4.6.1 Emergency Interties

Loma Linda has four connections to local water systems, including two with the City of San Bernardino, one with the City of Redlands, and one with Loma Linda University which could provide short-term water supplies. The emergency connection with the City of Redlands can yield approximately 507 AFY (314 gpm) to Loma Linda. Loma Linda cannot deliver water to Redlands through this intertie. The emergency connections with the City of San Bernardino can yield up to 4,033 AFY (2,500 gpm) total. The intertie pumps are tested monthly to ensure their reliability, accounting for about 1 – 2 AFY of Loma Linda's water supply. Loma Linda cannot deliver water to the City of San Bernardino through these interties. Loma Linda also maintains an interconnection with the Loma Linda University water system as an emergency connection only. There exists no formal agreement for the exchange of water between the City to the University; however, the connection is metered to monitor any exchange of water. Loma Linda can both purchase from and sell to Loma Linda University through this intertie.

3.4.6.2 Future Water Projects

There are currently no planned water supply projects.

3.4.7 Summary of Existing and Planned Sources of Water

Loma Linda anticipates utilizing a water system exclusively supported by groundwater from the Bunker Hill portion of the San Bernardino Basin produced by the City of Loma Linda.

As discussed in **Part 1 Chapter 5**, Loma Linda is applying a Reliability Factor of 15% to their supply reliability analysis to account for uncertainties in supply and demand projections. The 15% value is recommended in a study by the RAND Corporation that evaluated uncertainty factors in the regional supplies and demands, including population growth, per capita water use, climate change impacts on supplies and demands, SWP project supplies and local surface water supplies. See **Part 1 Chapter 5** for more details on how the Reliability Factor was established.

For the purposes of supply projections in this 2020 IRUWMP, Loma Linda is using the 15% Reliability Factor to establish a supply target of 15% more than total projected demand. All of the future supply will be produced from the San Bernardino Basin.

As discussed in **Part 1 Chapter 3**, the San Bernardino Basin is a shared resource, and the Western-San Bernardino Judgement does not limit pumping by agencies within the Valley District service area. Each agency can pump as much water as they need and if total pumping by all agencies exceeds the safe yield, Valley District is responsible for replenishing the SBB. As shown in **Part 1 Chapter 5**, the total planned use of San Bernardino Basin groundwater by all agencies in Valley District's service area, including the Reliability Factor, is below the safe yield of the SBB through 2045 so supplemental recharge is not anticipated to be required and is not included in Loma Linda's supply projection. However, the San Bernardino Groundwater

Council, which Loma Linda is a member of, may elect to recharge the SBB with supplemental water to provide additional supply reliability.

The volume of water utilized from each source in 2020 is summarized in **Table 3-9** and projected supply by source is summarized in **Table 3-10** and **Figure 3-4**.

Table 3-9. DWR 6-8R Actual Water Supplies in 2020 (AF)

-		2020		
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	San Bernardino Basin (Bunker Hill)	5,191	Drinking Water	See Note[1]
Purchased or Imported Water[1]	City of San Bernardino	1	Drinking Water	See Note[2]
	TOTAL:	**5,192**		

1. See Part 1 Chapter 3 for discussion of safe yield of regional groundwater basins
2. Deliveries from the San Bernardino Municipal Water Department are from monthly operation tests of Loma Linda's emergency interties.

Table 3-10. DWR 6-9R Projected Water Supplies (AF)

		2025	2030	2035	2040	2045
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	San Bernardino Basin (Bunker Hill)	6,472	6,668	6,863	7,049	7,236
	TOTAL:	**6,472**	**6,668**	**6,863**	**7,049**	**7,236**

Groundwater supplies from SBB are increased to meet the Total Supply Target with 15% Reliability Factor.

Table 3-11. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	6,472	6,668	6,863	7,049	7,236
Demand Totals From Table 4-3R	5,628	5,798	5,968	6,130	6,292
DIFFERENCE:	**844**	**870**	**895**	**919**	**944**

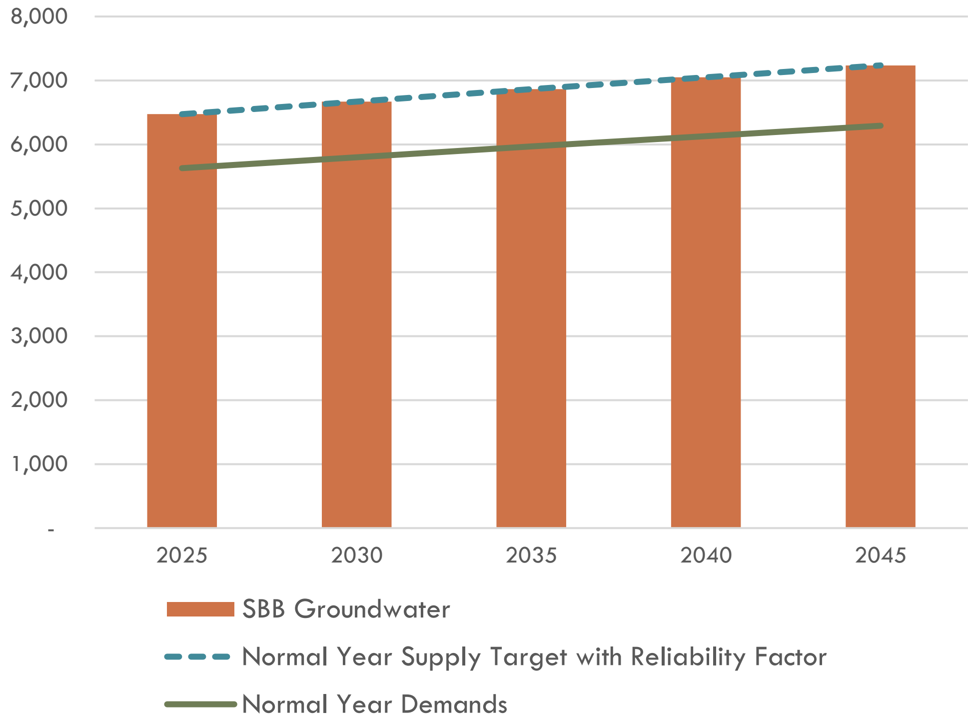


Figure 3-4: City of Loma Linda Projected Supply and Demand Comparison (AF)

3.4.8 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2020, Loma Linda consumed 1123.8 kWh of energy per AF of water delivered, which includes all of the City's water management facilities.

3.5 Water Service Reliability Assessment

This section considers Loma Linda's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from Loma Linda's current source of supply through 2045.

3.5.1 Constraints on Water Sources

In the past Loma Linda's groundwater supply was impacted by perchlorate from the Redlands-Crafton Plume. The Lockheed Martin Corporation replaced the two Loma Linda wells impaired by perchlorate with two new wells that include wellhead treatment. The City has also had to carefully monitor high arsenic, fluoride, and DBCP in well water. To address arsenic in City water, an arsenic removal facility was installed, providing treatment to two wells. Water from the various wells is blended to further dilute any contaminants and to achieve all applicable health and safety standards.

In addition to groundwater wells, Loma Linda also has various interconnections with adjacent water systems such as the University of Loma Linda, the City of San Bernardino, and the City of Redlands, to assist in alleviating localized problems should they arise. Based on current conditions water quality is not anticipated to affect Loma Linda's supply reliability. However, water quality issues are constantly evolving. Loma Linda will take action to protect and treat supply when needed, but it is well recognized water quality treatment can have significant costs.

3.5.2 Year Type Characterization

In general, groundwater is 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 BTAC and the SB Groundwater Council, monitor groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in **Part 1 Chapter 3.**

Per UWMP requirements, Loma Linda has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition 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.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

3.5.3 Water Service Reliability

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. 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% increase throughout the 5-year drought to be conservative. The results of the reliability assessment are summarized in the tables below.

As described in **Part 1 Chapter 3**, the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. Loma Linda is able to pump additional groundwater from Bunker Hill to meet total demands in dry years and participates in efforts to replenish the basins with imported and local water through regional recharge programs. Loma Linda's total groundwater supplies are not reduced in dry years so 2020 is considered the base year. Based on the analysis, Loma Linda does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, Loma Linda participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. Loma Linda also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 3-12**. The percent of average supply increases in drought years because Loma Linda's groundwater production will increase to meet an assumed increase in demands.

Table 3-12. DWR 7-1R Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS AS PERCENT OF AVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a single dry year are shown in **Table 3-13**. Loma Linda's demands in single dry years are assumed to increase by 10% above normal year demands. The SBB groundwater basin has storage for use in dry years so Loma Linda can produce the volume of water needed to meet increased demands in single dry years. The 15% Reliability Factor is also applied to supplies in a single dry year. Loma Linda's supplies are 100% reliable during single dry years.

Table 3-13. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals	7,120	7,334	7,549	7,754	7,959
Demand Totals	6,191	6,378	6,564	6,743	6,921
DIFFERENCE:	**929**	**957**	**985**	**1,011**	**1,038**

The projected supply and demand during five consecutive dry years are shown in **Table 3-14**. Loma Linda's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins Loma Linda produces water from have storage for use in dry years so Loma Linda can produce the volume of water needed to meet 100% of demands in multiple dry years. The 15% Reliability Factor is also applied to supplies in multiple dry years. Loma Linda's supplies are 100% reliable during multiple dry years.

Table 3-14. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
First	Supply Totals	7,120	7,334	7,549	7,754	7,959
Year	Demand Totals	6,191	6,378	6,564	6,743	6,921
	DIFFERENCE:	**929**	**957**	**985**	**1,011**	**1,038**
Second	Supply Totals	7,120	7,334	7,549	7,754	7,959
Year	Demand Totals	6,191	6,378	6,564	6,743	6,921
	DIFFERENCE:	**929**	**957**	**985**	**1,011**	**1,038**
Third	Supply Totals	7,120	7,334	7,549	7,754	7,959
Year	Demand Totals	6,191	6,378	6,564	6,743	6,921
	DIFFERENCE:	**929**	**957**	**985**	**1,011**	**1,038**
Fourth	Supply Totals	7,120	7,334	7,549	7,754	7,959
Year	Demand Totals	6,191	6,378	6,564	6,743	6,921
	DIFFERENCE:	**929**	**957**	**985**	**1,011**	**1,038**
Fifth	Supply Totals	7,120	7,334	7,549	7,754	7,959
Year	Demand Totals	6,191	6,378	6,564	6,743	6,921
	DIFFERENCE:	**929**	**957**	**985**	**1,011**	**1,038**

3.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because Loma Linda relies on groundwater basins with significant storage, available supplies do not vary on a monthly or seasonal basis, so this analysis is conducted on an annual basis. Projected demands, supplies, and use reduction and supply augmentation adjustments from 2021-2025 are shown in **Table 3-15**.

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. The 15% Reliability Factor is also applied to supplies in this DRA. As discussed in the Water Service Reliability Assessment, Loma Linda can produce additional groundwater to meet any increases in demand in dry years. This DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in **Section 3.5** and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for Loma Linda. Loma Linda can produce additional groundwater to meet any increases in demand in dry years.

As shown in **Part 1 Chapter 5**, the region as a whole has sufficient supplies to meet demands plus the 15% Reliability Factor, even in a 5-year drought. As shown in **Part 1 Chapter 5 Figure 5-1**, the SBB had over 4.8 million acre-feet in storage as of 2020 due to regional efforts to store water in wet years for use during dry years.

> Although projections in this Plan show that the regional water supplies are sufficient to meet the demands of Loma Linda and the Region as a whole, even during a 5-year drought (see Part 1 Chapter 5), Loma Linda remains committed to water conservation and to being a good steward of regional water resources to preserve supplies for the future due to the possibility of experiencing more severe droughts than anticipated in this Plan.

Table 3-15: DWR 7-5 Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	5,807
	Total Supplies	6,678
	SURPLUS	**871**
2022	Gross Water Use	5,903
	Total Supplies	6,788
	SURPLUS	**885**
2023	Gross Water Use	5,999
	Total Supplies	6,899
	SURPLUS	**900**
2024	Gross Water Use	6,095
	Total Supplies	7,009
	SURPLUS	**914**
2025	Gross Water Use	6,191
	Total Supplies	7,120
	SURPLUS	**929**

3.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that Loma Linda 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 a number of reasons, such as water supply 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 Loma Linda 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 Loma Linda maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

> The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. Loma Linda's WSCP is attached as Part 4, Appendix C-9.

3.8 Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that Loma Linda has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. Loma Linda's current per-capita consumption is less than its 2020 compliance target. Loma Linda expects to continue to implement current conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

3.8.1 Existing Demand Management Measures

Consistent with the requirements of the California Water Code, this section describes the required demand measurement measures that have been implemented in the past five years and will continue to be implemented into the future. Through the implementation of its active water conservation programs, Loma Linda has met its Confirmed Water use Target for 2020. To maintain efficient water use, Loma Linda intends to continue its current demand management measures for the foreseeable future to consider future water use requirements that may be implemented.

3.8.1.1 Water Waste Prevention Ordinances

Loma Linda has enacted Municipal Code Title 13 in Chapter 13.32 Water-efficient Landscape. The code covers new and rehabilitated landscaping for public agencies and private developments requiring permits. The projects must document the following for approval: maximum applied water allowance, estimated applied water use, estimated water use, design plan, irrigation design, irrigation schedule, maintenance schedule, landscape audit, and provision for existing landscape. Decorative water should be recirculated. Additionally, Ordinance 443 (Municipal Code Title 13 in Chapter 13.04.940 to 13.04.1070) prohibits excessive use of water specifically targeting water wash downs, runoff, irrigation, and malfunctioning equipment. Service can be discontinued with excessive use. Copies of these ordinances are provided in **Part 4, Appendix C-9.**

3.8.1.2 Metering

All of the City's residential, commercial, and industrial customers are metered and billed bi-monthly with tiered rates. Municipal customers are metered but not billed; the meter reading began for these customers in July 2009. The City has a meter maintenance and replacement program with replacements occurring every 10 years, larger meters every 5 years and annual calibration of the meters at the Veterans Administration Hospital. Over the past five years, the City has upgraded all meters to Automatic Meter Readers (AMR).

3.8.1.3 Conservation Pricing

All of Loma Linda's retail customers are metered and billed with tiered rates bimonthly. A tiered rate structure is in place that charges per water unit based on total amount of water used during the billing cycle.

3.8.1.4 Public Education and Outreach

Loma Linda is partnered with 19 other Inland Empire Water Agencies to form iEfficient.com, a regional approach to conservation and messaging. The outreach campaign has helped implement the following:

- Collaborative communication effort focused on ending water waste through outreach & education;
- Sharing information unique to the IE through On-Hold messages, Mailers, Bill inserts, Lawn signs, Promotional items, Event participation, and Special outreach events;
- Using Press Conferences, Press Releases, Holding Statements, Fact Sheets, Targeted advertising, Presence on website and outreach materials, Participation in social media, and Regular live events; and
- Use of iEfficient app and iEfficient Customer Relationship Toolkit.

3.8.1.5 Programs to Assess and Manage Distribution System Real Losses

Loma Linda plans to complete the AWWA Water Audit worksheet annually to assess distribution system loss. Based on water loss analysis, upgrades to the distribution system will be scheduled and performed.

3.8.1.6 Water Conservation Program Coordination and Staffing Support

Loma Linda participates in regional conservation efforts led by Valley District (iEfficient.com) and DWR (saveourwaterrebates.com).

3.9 Adoption, Submittal and Implementation

This section describes Loma Linda's process for adopting, submitting, and implementing the 2020 IRUWMP and Loma Linda's WSCP.

3.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to Loma Linda's public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within Loma Linda's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

> Loma Linda provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in Part 4, Appendix C-2.

3.9.2 Public Hearing and Adoption

Loma Linda held a public hearing on June 29, 2021 to hear public comment and consider adopting this 2020 IRUWMP and Loma Linda's WSCP.

As part of the public hearing, the Loma Linda provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed Loma Linda the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

> Loma Linda's adoption resolution for the 2020 IRUWMP and Loma Linda's WSCP is included in Part 4, Appendix C-3.

3.9.3 Plan Submittal

Loma Linda will submit the 2020 IRUWMP and Loma Linda's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. 2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

3.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, Loma Linda will make the plan available for public review during normal business hours by placing a copy of the 2020 IRUWMP and Loma Linda's WSCP at the front desk of the City's office, and by posting the plans on the City's website for public viewing.

3.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or Loma Linda's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

CITY OF REDLANDS

2020 IRUWMP

Part 2 Chapter 4

Redlands 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

4

RETAIL URBAN WATER MANAGEMENT PLAN

City of Redlands

This chapter describes information specific to the City of Redlands, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the City of Redlands' reporting requirements for 2020 under the UWMP Act.

The City of Redlands (Redlands or City) has provided water services to the community since 1910. Redlands is a retail public water supplier that meets the definition of an urban water supplier with over 23,600 municipal water service connections in 2020.

The water utility service area generally coincides with the City's incorporated area and sphere of influence. The service area encompasses 22 square miles inside the City's corporate boundaries and 7 square miles outside City boundaries. Water use is largely attributed to landscape irrigation due to arid climate and large residential lots.

A small part in the southeastern section of the City is currently served by Western Heights Mutual Water Company and is not part of this UWMP. **Figure 4-1** shows the Redlands water service area.

All volumes of water in this chapter are presented in units of Acre-Feet (AF). One AF is the volume of water required to cover 1 acre with 1 foot of water, or approximately 325,851 gallons.

IN THIS SECTION

Currently, the majority of water is obtained from the Santa Ana River, Mill Creek, and local groundwater. The City operates two surface water treatment plants, 23 wells, 44 booster pumps, 18 reservoirs, and approximately 450 miles of transmission and distribution lines to provide water to its customers. The City also delivers non-potable and recycled water to customers for irrigation and other non-potable uses.

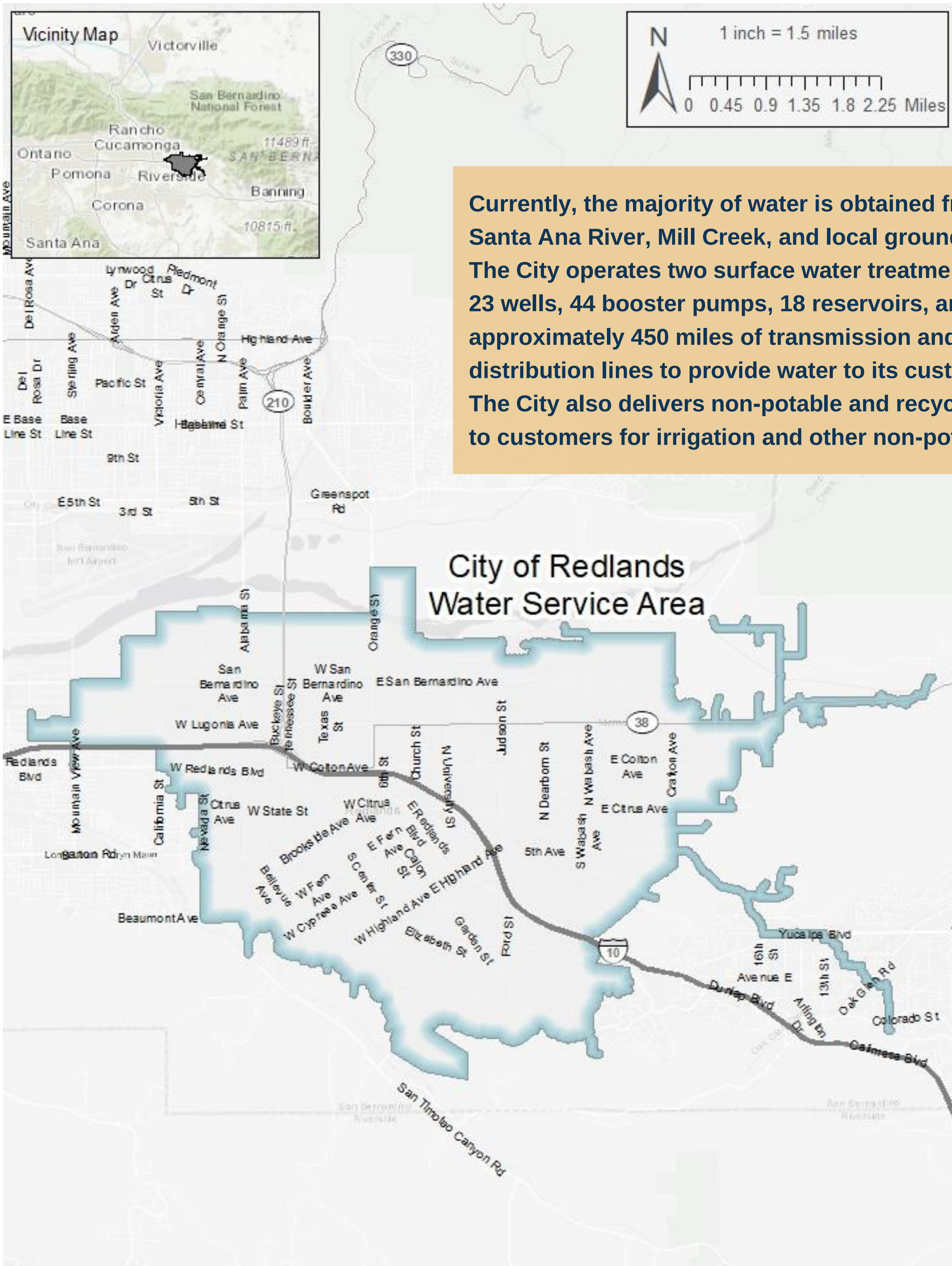


Figure 4-1: City of Redlands Water Service Area Map

4.1 System Description

This section describes the population and land uses within Redlands' service area. The regional climate, which includes Redlands' service area, is described in **Part 1**, **Chapter 2** of the 2020 IRUWMP.

4.1.1 Population

For the purposes of consistent reporting of population estimates, the California Department of Water Resources (DWR) has developed a GIS-based tool (DWR Tool) to estimate the population within a water agency's service area using census data and number of water service connections. The DWR Tool was used to intersect the service area boundary with census data to provide population estimates for 1990, 2000, and 2010. The DWR Tool uses the number of service connections in those prior census years, where available, to calculate a persons-per-connection factor, which is then projected forward to estimate population in a given year using the number of connections in that year. The service area population for 2020 was estimated in the DWR Tool using the number of connections in 2010 and 2020.

To estimate population for future years, projections from the Southern California Association of Governments (SCAG) were used. SCAG has developed a forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and in 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. The service area boundary was intersected with a GIS shapefile of the SCAG TAZs to provide an estimate of population within the service area for years 2020, 2035, and 2045. These estimates were used to calculate compound annual population growth rates for years 2020-2035 and 2035-2045. The population growth rates were applied to the 2020 population to estimate future population. Estimated 2020 and future year population is shown in **Table 4-1**.

Per SCAG requirements, it must be noted that this population modeling analysis was performed by Water Systems Consulting, Inc. based upon modeling information originally developed by SCAG. SCAG is not responsible for how the model is applied or for any changes to the model scripts, model parameters, or model input data. The resulting modeling data does not necessarily reflect the official views or policies of SCAG. SCAG shall not be held responsible for the modeling results and the content of the documentation.

SCAG prepares demographic forecasts based on land use data for their region through extensive processes that emphasizes input from local planners and is done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Table 4-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	78,052	81,367	84,822	88,424	91,727	95,153

4.1.2 Land Use

Per the 2017 City of Redlands General Plan, 27% of the land within the City of Redlands is single family residential, 3% is multi-family residential, 3% is commercial, 5% is industrial, 4% is public and institutional facilities, 16% is parks and open space, 4% is agricultural, and 5% is other uses including the Redlands Municipal Airport, utilities facilities, and public parking lots. The balance is made up of vacant land and public and private rights of way (railroads and private roads). This is shown in **Figure 4-2.**

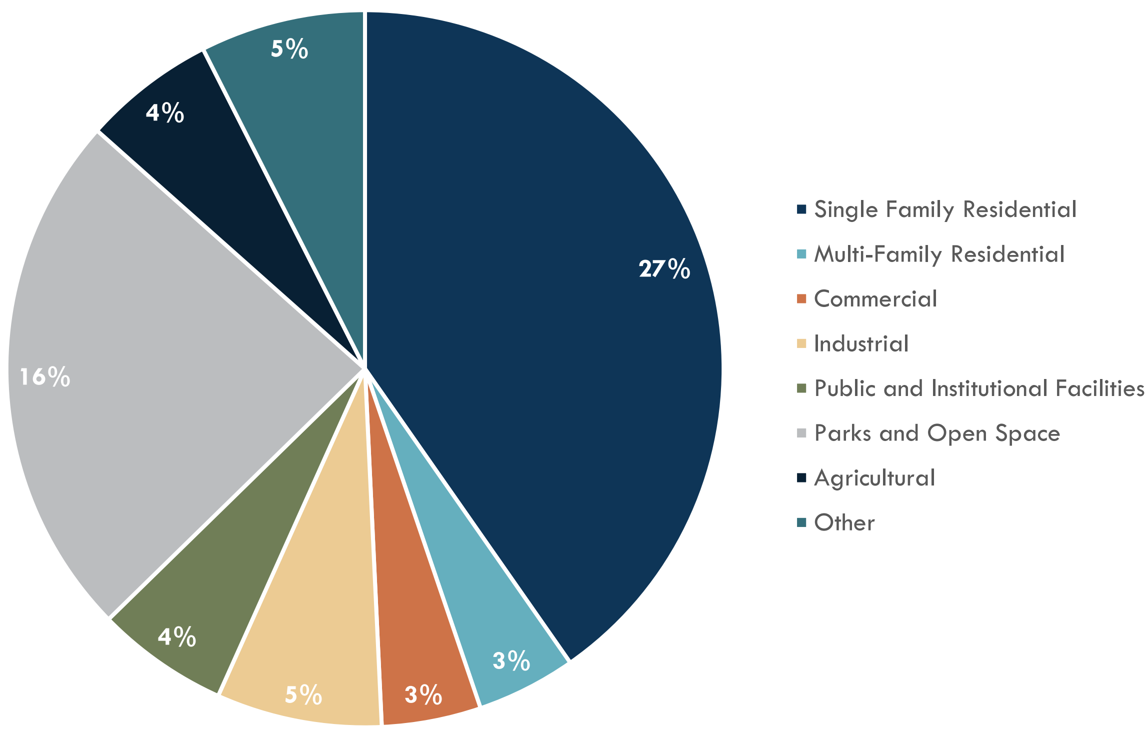


Figure 4-2. Land Uses

4.2 Water Use

This section describes the current and projected water uses within Redlands' service area.

4.2.1 Potable versus Non-Potable Water Use

In addition to serving potable water for domestic use, Redlands provides non-potable groundwater and recycled water to customers in its service area for irrigation, industrial, and other non-potable uses. Recycled water from the City of Redlands Wastewater Treatment Plant (WWTP) is used by the Mountain View Power Plant and a landfill. 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 Redlands' non-potable system. This water is billed as "raw water" in Redlands' billing system. Redlands also maintains other separate non-potable systems that are supplied exclusively by non-potable groundwater and raw surface water. This water is also billed as "raw water" in Redlands' billing system.

4.2.2 Water Use by Sector

Redlands categorizes its water customers 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 a landfill.

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. The number of active connections in each category from 2016 to 2020 are shown in **Table 4-2**.

Table 4-2: City of Redlands 2016-2020 Connections by Customer Class

CUSTOMER CLASS	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	1,375	1,373	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

CUSTOMER CLASS	2016	2017	2018	2019	2020
Landscape – Raw[1]	111	121	124	124	135
Agricultural Irrigation – Raw	13	9	10	5	3
Total Potable and Raw	*23,164*	*23,208*	*23,223*	*23,158*	*23,692*
Recycled Water[2]	2	2	2	2	2
TOTAL	**23,166**	**23,210**	**23,225**	**23,160**	**23,694**

[1] In 2016, 48 Landscape – Raw connections were served a blend of recycled water from the Redlands Wastewater Treatment Plant and non-potable water. The number of Landscape – Raw connections receiving a recycled water blend has increased to 73 connections in 2020.

[2] Recycled Water connections only include the Mountain View Power Plant and a landfill.

4.2.2.1 Past Water Use

Redlands' actual water use by customer class from 2016-2020 is shown in **Table 4-3** and **Figure 4-3**. Approximately 94% of Redlands deliveries are potable water. Of potable deliveries, approximately 61% are to single family connections, followed by 14% to multi-family connections, 12% to commercial and institutional connections, with the balance going to landscape, irrigation, and other connections.

Table 4-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Single Family	11,340	12,275	12,866	11,624	12,949
Multi-Family	2,835	2,913	2,934	2,750	2,901
Commercial/Institutional	3,180	3,142	3,159	2,705	2,640
Landscape	1,924	2,155	2,340	2,228	2,220
Agricultural Irrigation	556	387	326	283	276
Other	183	253	179	174	151
Commercial/Institutional – Raw	102	175	175	167	158
Landscape – Raw[1]	1,259	1,311	1,405	1,096	1,267
Agricultural Irrigation – Raw	47	33	16	6	4
Water Losses	901	2,177	1,639	2,211	3,327
TOTAL POTABLE AND RAW	**22,327**	**24,822**	**25,038**	**23,244**	**25,892**
Recycled Water – Direct[1]	1,866	1,448	878	680	994
TOTAL DEMAND	**26,537**	**26,270**	**25,916**	**23,924**	**26,866**

[1]Recycled Water – Direct demand only includes deliveries made to the Mountain View Power Plant and landfill recycled water connections. Other recycled water use is included in the blended non-potable water served as Landscape – Raw water.

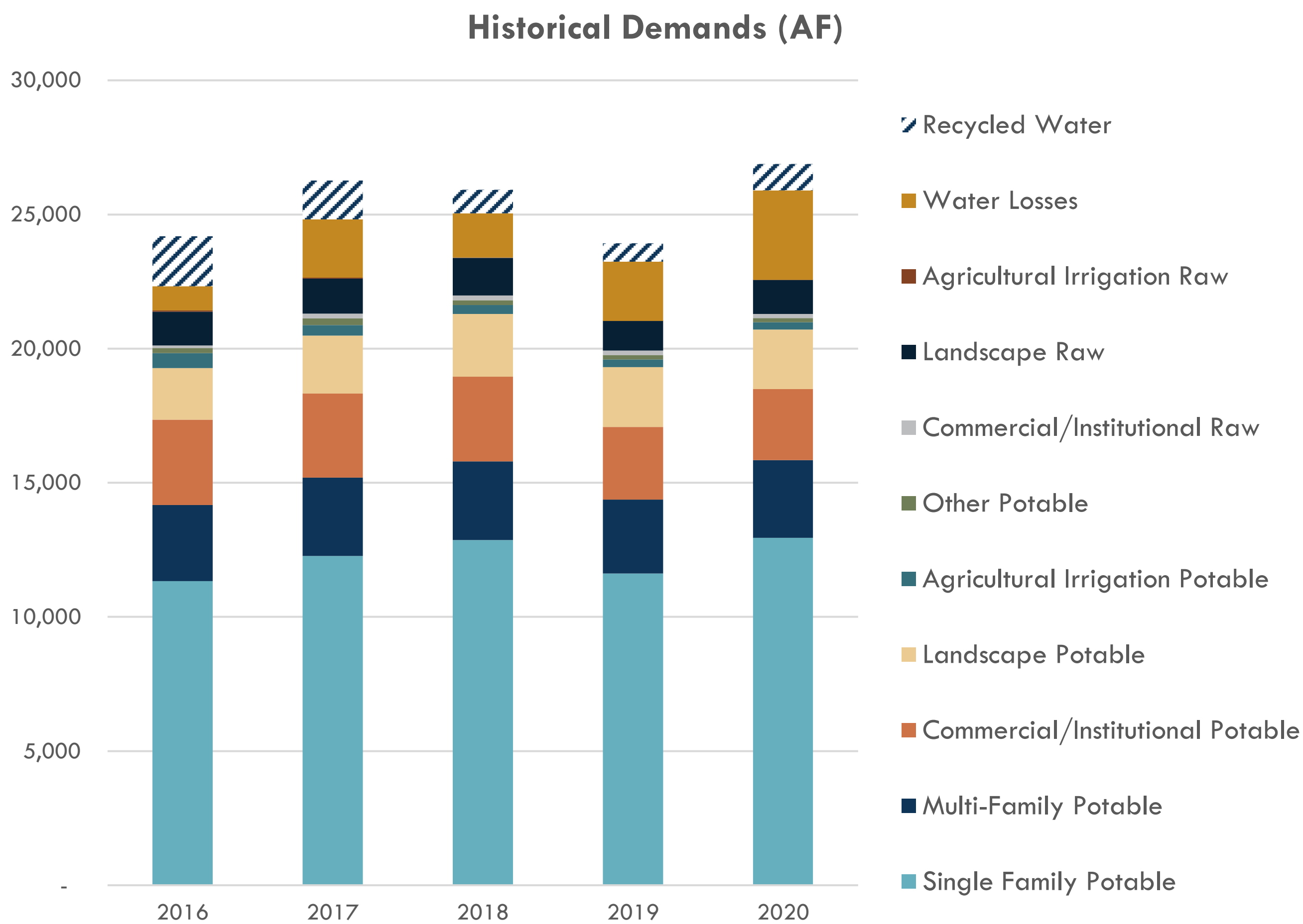


Figure 4-3: City of Redlands 2016-2020 Water Consumption by Customer Class

4.2.2.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water.

Sources of water loss include:

- Leaks from water lines - Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall water loss. Aging pipes typically have more leaks.
- Water used for flushing and fire hydrant operations
- Unauthorized uses or theft of water
- Customer Meter Inaccuracies - Customer meters can under-represent actual consumption in the water system.

Redlands monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4 Appendix D-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 4-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020. Redlands will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 4-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS
1	2016	1,977
1	2017	1,637
1	2018	790
1	2019	2,003
1	2020	3,327 (Estimated)

In the past 5 years, Redlands' water loss has ranged from 3% - 15% of water sales. For the purposes of future water use projections, water loss is assumed to be 10% based on 2019 losses, which the City considers to be the most accurate estimate due to data quality.

Redlands is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standard that is being developed by the State Water Board. Current and planned programs to manage water loss are described in **Section 4.8.1.5**.

4.2.3 Projected Water Use

A demand forecast tool was developed to estimate future demands based on individual customer categories and connections, with the ability to forecast how future changes in indoor and outdoor water use may impact overall water use within each different customer type for current and future customers.

The tool has three steps to project demand:

1. Establish a demand factor per connection for each customer class based on historical consumption data.
2. Project the number of new connections anticipated for each customer class in each 5-year period after 2020.
3. Modify demand factors as appropriate to account for expected changes in future water use.

The demand factors for each customer class were based on connection and demand data from calendar year 2016-2020, 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, the demand factor is multiplied by the number of estimated new connections and added to the average 2016-2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the total future water use. Redlands anticipates that future commercial/institutional connections, where available, will be dual-metered 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 future demands by customer class are presented in **Table 4-5**, **Table 4-6**, and **Figure 4-4**.

Table 4-5: DWR 4-2R Projected Demands for Potable and Raw Water (AF)

	PROJECTED WATER USE				
CUSTOMER CLASS	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
TOTAL:	**25,818**	**26,860**	**27,902**	**28,818**	**29,735**

Table 4-6: DWR 4-3R Total Gross Water Use (AF)

-	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	25,892	25,818	26,860	27,902	28,818	29,735
Recycled Water Demand* From Table 6-4R	994	1,173	1,173	1,173	1,173	1,173
TOTAL WATER USE:	**26,866**	**26,991**	**28,033**	**29,075**	**29,991**	**30,908**

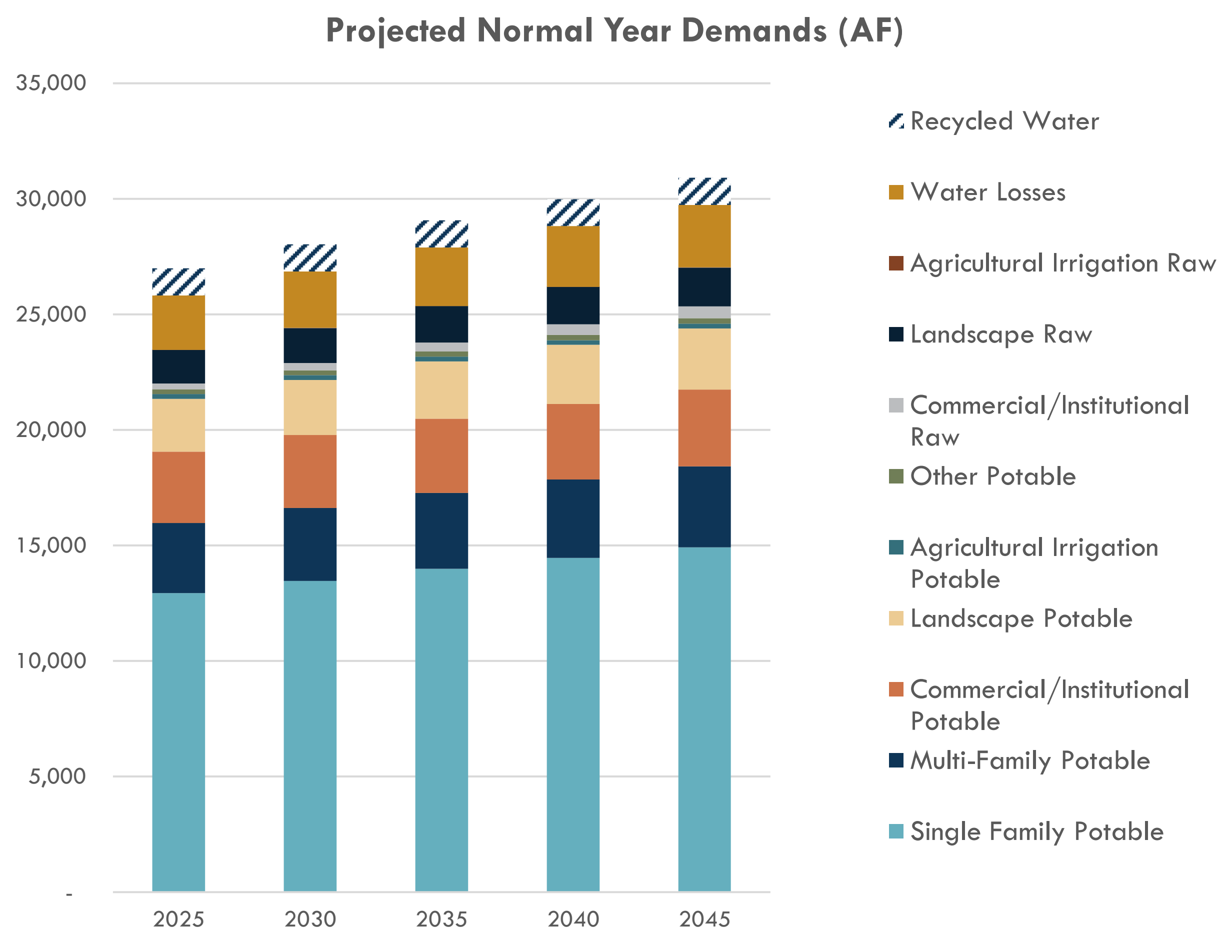


Figure 4-4: City of Redlands Projected Future Water Consumption by Customer Class

4.2.3.1 Estimating Future Water Savings

The demand tool used to project future water use has the capability to modify demand factors for both new and existing connections to quantify reductions in current and future customer demand that may occur as a result of active conservation programs implemented by Redlands or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. Redlands may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, Redlands has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of Redlands' new water use objective are still under development and will take effect in 2023. Once the new standards have been established, Redlands will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. Redlands is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

4.2.4 Water Use for Lower Income Households

Senate Bill 1087 requires water use projections in an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier.

Based on SCAG's 6th cycle final regional housing needs allocation (RHNA), it is estimated that the percentage of very-low and low-income households in the City of Redlands service area is 45 percent. These demands have been included in the future demand projections in **Table 4-5**.

4.2.5 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

4.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets the City developed and demonstrates that compliance by 2020 was achieved.

Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for Redlands' calculations are included in **Part 4 Appendix D-7**.

4.3.1 Baseline and Target

Redlands' baseline and 2020 target was calculated in the 2015 RUWMP and has not changed for this plan. More details on the development of the baselines and target can be found in the 2015 RUWMP and **Part 4 Appendix D-7**. Redlands' calculated water use target for 2020 is 285 GPCD.

4.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, Redlands has met its Confirmed Water use Target for 2020 of 285 GPCD, as shown in **Table 4-7**. To maintain this level of water use that occurred in 2019 when the target was met, Redlands intends to continue its current level of outreach and programs for the foreseeable future.

Table 4-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
285	279	Yes

4.4 Water Supply

Redlands' water supply is comprised primarily of 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 and a small amount of imported water when needed. More information about local groundwater basins is included in Part 1, Chapter 3 of the 2020 IRUWMP.

4.4.1 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.

4.4.2 Groundwater

Redlands extracts groundwater from the Bunker Hill Subbasin (also known as San Bernardino Basin or SBB) and Yucaipa Subbasin. Redlands' historical production for the past five years is shown in **Table 4-8**. Extractions shown include both potable and non-potable water.

Table 4-8. DWR 6-1R Groundwater Volume Pumped (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	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**	**13,527**	**14,485**	**11,680**	**13,916**

4.4.3 Surface Water

The City receives its surface water from the following sources:

- **Mill Creek Watershed:** Water from the Mill Creek watershed is treated at Henry Tate (Tate) Surface Water Treatment Plant (SWTP).
- **Santa Ana River Watershed:** Water from the Santa Ana River watershed is treated at the Horace P. Hinckley SWTP.

The City has ownership in a variety of private and mutual water companies to supply water to the City's Tate and Hinckley SWTP's. 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. The City's founders were wise to realize the value of this commodity and sought ownership of water rights in the surrounding tributaries and from local water companies and water right owners. Based on a 10-year average, surface water totals 38% of the City's annual water production, including potable, non-potable, and recycled water.

As discussed in **Section 4.4.1**, the City sometimes supplements surface water supplies with SWP water, which is then treated at Tate or Hinckley SWTP and distributed for potable use.

4.4.4 Stormwater

Redlands is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the basins Redlands produces water from. These regional projects are discussed in **Part 1 Chapter 3**.

4.4.5 Wastewater and Recycled Water

The City is a sewering agency that treats approximately 5.9 million gallons of wastewater daily as of 2020. The City's Wastewater Treatment Plant (WWTP) has the capability of treating 9 million gallons a day (MGD) to a secondary level. Of that, 7.2 MGD can be treated to a Title 22-Recycled Water level.

The City utilizes all wastewater collected and treated at its WWTP in its service area for:

- Distribution to customers
- Percolation into Bunker Hill

Treated wastewater distributed to customers is tertiary treated, known as Title 22-Recycled Water. The City's recycled water customers include Southern California Edison (SCE) Company, a landfill and recycled/non-potable water customers located in the 1350 pressure zone. 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. Based on 2020 volumes, approximately 1.6 MGD of treated wastewater was used as recycled water supply for customers, and 3.4 MGD was used for recharge. The remaining water was used within the WWTP or accounted for as losses through the process, meter inaccuracies or evaporation.

It is estimated that approximately 97% or 5.7 MGD of the wastewater collected at the City of Redlands WWTP was generated within Redlands' water service area in 2020.

Information about wastewater collected and treated is presented in **Table 4-9** and **Table 4-10**.

4.4.5.1 Potential, Current, and Projected Recycled Water Uses

The expansion of the recycled water system is limited by its supply, as well as infrastructure development and the Title 22-Recycled Water permitting process. However, because the City requires new commercial development to provide dual metering for irrigation systems, to accommodate the use of recycled/non-potable water, all recycled water may be utilized for distribution to recycled/non-potable water customers in the 1350 zone and eventually the 1570 pressure zone, as demand and infrastructure increases. The City's Capital Improvement Plan includes the design and construction of two recycled water reservoirs that will total up to a volume of 2,000,000 gallons of storage, a 1,500 gallons per minute booster pump station, and 9,400 linear feet of pipeline. Construction of these facilities will increase the use of recycled water in the 1350 and 1570 pressure zones by 826 AFY.

Table 4-9. DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

Percentage of 2020 service area covered by wastewater collection system (optional):

Percentage of 2020 service area population covered by wastewater collection system (optional):

WASTEWATER COLLECTION	RECIPIENT OF COLLECTED WASTEWATER					
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
City of Redlands	Metered	6,421	City of Redlands	Redlands Wastewater Treatment Facility	Yes	No

Table 4-10. DWR 6-3R Wastewater Treatment and Discharge within Service Area in 2020 (AF)

							2020 VOLUMES				
WASTEWATER TREATMENT PLANT NAME	DISCHARGE LOCATION NAME OR IDENTIFIER	DISCHARGE LOCATION DESCRIPTION	WASTEWATER DISCHARGE ID NUMBER	METHOD OF DISPOSAL	PLANT TREATS WASTEWATER GENERATED OUTSIDE THE SERVICE AREA	TREATMENT LEVEL[1]	WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIREMENT
Redlands Wastewater Treatment Facility	Spreading Basins	8 basins located 1,100 ft east of WWTP		Percolation ponds	Yes	Secondary, Disinfected -23	6,620	3,813	1,806		
						TOTAL:	**6,620**	**3,813**	**1,806**	**-**	**-**

Notes:

1. Discharged Treated Wastewater is treated to Secondary, Disinfected-23 standards, but Recycled Water used within the service area is treated to Tertiary standards.
2. Secondary, Disinfected-23 indicates Recycled Water that has been oxidized and disinfected per California Code of Regulations Title 22, S60301.225.
3. Tertiary indicates Recycled Water that has been oxidized, filtered, and disinfected per California Code of Regulations Title 22, S60301.230.

4.4.6 Water Exchanges and Transfers

Redlands exchanges water with Valley District and local water companies through various agreements.

4.4.6.1 Emergency Interties

Redlands has two interties with neighboring water agencies, Western Heights Water Company, and the City of Loma Linda.

4.4.6.2 Future Water Projects

The City is in the process of updating their Water Master Plan and their Non Potable/Recycled Water Master Plan to identify necessary upgrades to its distribution systems. These plans are intended to identify projects needed to increase the reliability of the City's systems; they are not intended to create new sources of supply.

Additionally, the City is currently undergoing a seismic assessment of its water infrastructure that will identify projects to strengthen the infrastructure to further enhance reliability during a catastrophic earthquake.

4.4.7 Summary of Existing and Planned Sources of Water

Redlands' water supply is comprised primarily of 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 and a small amount of imported water when needed. This same mix of supplies is anticipated to be used in the future.

The City's use of the Yucaipa Basin is solely used for non-potable water for irrigation as the sources are high in nitrates.

As discussed in **Part 1 Chapter 5**, Redlands is applying a Reliability Factor of 15% to their supply reliability analysis to account for uncertainties in supply and demand projections. The 15% value is recommended in a study by the RAND Corporation that evaluated uncertainty factors in the regional supplies and demands, including population growth, per capita water use, climate change impacts on supplies and demands, SWP project supplies and local surface water supplies. **See Part 1 Chapter 5** for more details on how the Reliability Factor was established.

For the purposes of supply projections in this 2020 IRUWMP, Redlands is using the 15% Reliability Factor to establish a Total Supply Target of 15% more than total projected demand. It is assumed that any additional supply needed will be produced from the San Bernardino Basin.

The volume of water utilized from each source in 2020 is summarized in **Table 4-11** and projected supply by source is summarized in **Table 4-12**.

Table 4-11. DWR 6-8R Actual Water Supplies in 2020 (AF)

		2020		
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	Bunker Hill (part of SBB)	12,088	Drinking Water	
Groundwater (not desalinated)	Bunker Hill (part of SBB)	1,531	Other Non-Potable Water	
Groundwater (not desalinated)	Yucaipa	297	Other Non-Potable Water	
Surface water (not desalinated)	Santa Ana River (part of SBB)	5,796	Drinking Water	
Surface Water (not desalinated)	Mill Creek (part of SBB)	6,045	Drinking Water	
Purchased or Imported Water	SWP - Direct Deliveries	535	Drinking Water	
Recycled Water	Recycled Water - Direct	1,806	Recycled Water	
	TOTAL:	**28,098**		

Table 4-12. DWR 6-9R Projected Water Supplies (AF)

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	PROJECTED WATER SUPPLY 2025 REASONABLY AVAILABLE VOLUME	2030 REASONABLY AVAILABLE VOLUME	2035 REASONABLY AVAILABLE VOLUME	2040 REASONABLY AVAILABLE VOLUME	2045 REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	Bunker Hill (part of SBB)	12,973	13,922	14,861	15,677	16,484
Recycled Water	Bunker Hill - Recycled Water Recharge	3,766	4,015	4,275	4,513	4,760
Groundwater (not desalinated)	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
Surface water (not desalinated)	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**	**32,238**	**33,436**	**34,490**	**35,544**

Supplies shown in this table are planned pumping or diversions, except supplies from San Bernardino Basin are increased to meet the Total Supply Target with 15% Reliability Factor.

Table 4-13. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	31,039	32,238	33,436	34,490	35,544
Demand Totals From Table 4-3R	26,991	28,033	29,075	29,991	30,908
DIFFERENCE:	**4,049**	**4,205**	**4,361**	**4,499**	**4,636**

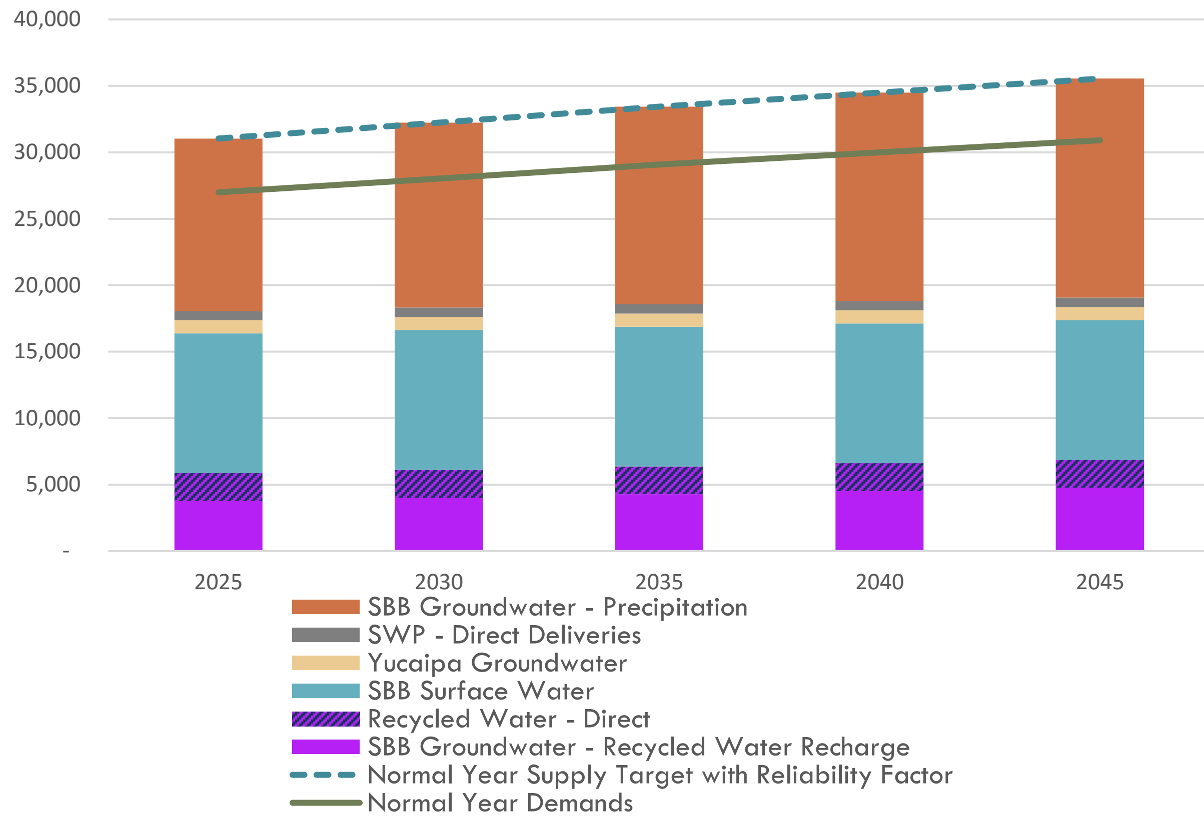


Figure 4-5: City of Redlands Projected Supply and Demand Comparison (AF)

4.4.8 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2020, Redlands consumed of 421.2 kWh of energy on water facilities per AF of water delivered.

4.5 Water Service Reliability Assessment

This section considers Redlands' water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from Redlands' current source of supply through 2045.

4.5.1 Constraints on Water Sources

Regular monitoring of groundwater contaminants is performed to meet the Environmental Protection Agency and State Water Resources Control Board- Division of Drinking Water's regulatory requirements set due to the industrial and commercial industries within the watershed. Based on the results from these samples, increased monitoring or treatment may be necessary if resources are impaired, in order to meet all drinking water standards.

4.5.2 Year Type Characterization

In general, 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 BTAC, monitor groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in **Part 1, Chapter 3**.

Per UWMP requirements, Redlands has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition 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.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

4.5.3 Water Service Reliability

The results of the reliability assessment are summarized in the tables below.

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. 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% increase throughout the 5-year drought to be conservative.

As described in **Part 1 Chapter 3**, the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. 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, Redlands' total supplies are not reduced in dry years so 2020 is considered the base year for all year types. Based on the analysis, Redlands does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, Redlands participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. Redlands also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 4-14**. The percent of average supply increases in drought years because Redlands's groundwater production will increase to meet an assumed increase in demands.

Table 4-14. Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS AS PERCENT OF AVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a normal year are shown in **Table 4-13**.

The projected supply and demand during a single dry year are shown in **Table 4-15**. Redlands' demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basins Redlands produces water from have storage for use in dry years so Redlands can produce the volume of water needed to meet 100% of demands in single dry years. Redlands' supplies are 100% reliable during single dry years.

Table 4-15. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals	34,143	35,461	36,780	37,939	39,098
Demand Totals	29,690	30,836	31,982	32,990	33,998
DIFFERENCE:	**4,453**	**4,625**	**4,797**	**4,949**	**5,100**

The projected supply and demand during five consecutive dry years are shown in **Table 4-16**. Redlands' demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins Redlands produces water from have storage for use in dry years so Redlands can produce the volume of water needed to meet 100% of demands in multiple dry years. Redlands's supplies are 100% reliable during multiple dry years.

Table 4-16. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

-	-	2025	2030	2035	2040	2045
First	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
-	**DIFFERENCE:**	**4,453**	**4,625**	**4,797**	**4,949**	**5,100**
Second	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
-	**DIFFERENCE:**	**4,453**	**4,625**	**4,797**	**4,949**	**5,100**
Third	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
-	**DIFFERENCE:**	**4,453**	**4,625**	**4,797**	**4,949**	**5,100**
Fourth	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
-	**DIFFERENCE:**	**4,453**	**4,625**	**4,797**	**4,949**	**5,100**
Fifth	Supply Totals	34,143	35,461	36,780	37,939	39,098
Year	Demand Totals	29,690	30,836	31,982	32,990	33,998
-	**DIFFERENCE:**	**4,453**	**4,625**	**4,797**	**4,949**	**5,100**

4.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required 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, so this analysis is conducted on an annual basis. Projected demands and supplies from 2021-2025 are shown in **Table 4-17**.

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. This DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in **Section 4.5** and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for Redlands. Redlands can produce additional groundwater to meet any increases in demand in dry years. As shown in Part 1 Chapter 5, the region as a whole has sufficient supplies to meet demands plus the 15% Reliability Factor, even in a 5-year drought. As shown in Part 1 Chapter 5 Figure 5-1, the SBB had over 4.8 million acre-feet in storage as of 2020 due to regional efforts to store water in wet years for use during dry years.

Although projections in this Plan show that the regional water supplies are sufficient to meet the demands of Redlands and the Region as a whole, even during a 5-year drought (see Part 1 Chapter 5), Redlands remains committed to water conservation and to being a good steward of regional water resources to preserve supplies for the future due to the possibility of experiencing more severe droughts than anticipated in this Plan.

Table 4-17: Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	29,598
	Total Supplies	34,037
	Surplus	4,440
2022	Gross Water Use	29,621
	Total Supplies	34,064
	Surplus	4,443
2023	Gross Water Use	29,644
	Total Supplies	34,090
	Surplus	4,447
2024	Gross Water Use	29,667
	Total Supplies	34,117
	Surplus	4,450
2025	Gross Water Use	29,690
	Total Supplies	34,143
	Surplus	4,453

4.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (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 a number of reasons, such as water supply 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 Redlands maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. Redlands' WSCP is attached as **Part 4 Appendix D-9**.

4.8 Demand Management Measures

The City of Redlands is committed to an effective water conservation program and has had a program in place since 1997. The Demand Management Measures (DMM) section provides a comprehensive description of the water conservation programs that Redlands has implemented for the past five years, is currently implementing, and plans to implement in order to maintain reliability of its water supplies.

4.8.1 Existing Demand Management Measures

Consistent with the requirements of the CWC, this section describes the required demand measurement measures (DMM) that have been implemented in the past five years and will continue to be implemented into the future.

4.8.1.1 Water Waste Prevention Ordinances

Since 1991, a water waste prevention ordinance has been in place to address water waste and shortages (see Part 4, Appendix D-9). The ordinance outlines conservation stages to be implemented based on water supply availability and increasing prohibitions on actions that waste water. However, Stage I requires only voluntary conservation from June 1-October 1 and does not require any specific prohibition of water waste. As State mandates on water use practices increase, the City intends to modify the Ordinance by adding additional stages as well as require specific prohibitions of water waste at all times.

4.8.1.2 Metering

The City water distribution system is fully metered. Since 2008, the City has had a meter replacement and maintenance plan in place. Previously meters smaller than 2" were replaced every 15-20 years and meters over 2" were calibrated to ensure accuracy. In 2020, the City initiated a random selection of meters throughout the City to conduct meter accuracy tests on an annual basis. As a result of this meter accuracy study, the City has developed a 5-year water meter replacement capital improvement project to ensure all inaccurate meters are replaced in this time period.

4.8.1.3 Conservation Pricing

The City currently uses a traditional tiered rate structure that promotes water conservation at an accurate price for the service provided. The traditional tiered rate structure has two components, a service charge, which is based on meter size, and a commodity charge. The commodity charge is based on the amount of water delivered and increases as the amount of water delivered increases, based on the cost of providing the additional amounts of water. This increase is due to the City utilizing its least expensive sources first before using more costly sources. The amount of water available within each of the three tiers is based on a 10-year average of water utilized from each source. Regardless of the customer type, each customer receives the same amount of water from each tier throughout the year.

4.8.1.4 Public Education and Outreach

Due to the efforts in response to SB X7-7, and the effects due to the recent drought, the City established programs that further decrease water demand and assist to ensure a sustainable water supply for future generations. Efforts including the City's tiered water rate structure and water audit program have helped to make the City's water conservation efforts known, however starting in 2010, efforts to reach customers increased significantly. The renewed focus often pointed to customer accountability, while offering City support through programs promoting conservation. This changed focus, aided by the publicity of recent drought, has engaged City customers to take water conservation seriously which can be seen in the City's ability to meet its 2020 water reduction requirement.

The following programs/efforts have increased engagement with customers:

- Water Efficiency Rebate Program which provides incentives for:
  - Weather Based Irrigation Controllers (WBIC's)
  - Drought Tolerant Lawn Conversions
  - Synthetic Turf Replacement
  - Water Efficient Clothes Washers
  - High Efficiency Sprinkler Nozzles

  - High Efficiency Toilets
- Top 10% Highest Water User Letter: Contact efforts
- Design and construction of four demonstration gardens
- Participation in regional marketing campaign
- Educational outreach events

In addition to use of bill stuffers, the City advertises water conservation programs and restrictions through use of the following:

- Bill messages and water use comparison charts
- Bulk postcard mailings
- Consumer Confidence Report advertisements
- Newspaper advertisements
- Electronic signboards
- Event presence
- Street banners
- Social media
- Smartphone app

Additionally, the City offers free water saving products to customers to assist in water conservation. These products have included:

- Hose nozzles
- Toilet leak detection tablets
- Lawn/plant moisture meters
- Low water use plants (at local events)
- Shower timers
- Faucet aerators
- Water efficiency educational collateral

In 2017, the City created an educational program focused on educating children on water waste and efficiency outdoors. The program is built on the story of sibling alligators--Ira the irriGATOR and Eva the investiGATOR, who go on adventures to teach children about proper outdoor irrigation techniques for turf and low water use plants and how to identify water waste. Approximately 70% of water use in Redlands is attributed to outdoor irrigation. This campaign expects to yield long term water savings as its focus assists to shift mindsets to view water efficiency and water saving landscapes as the “new normal” for California.

As budgets allow, the City plans to continue the programs/efforts listed above, as well as implement new programs. Future plans include removal of turf from the remaining City-owned medians and conversion of 200+ City-operated irrigation controllers to weather based irrigation controllers connected to a centralized system. Currently, City staff manually turns off all controllers during rain events. Significant water savings are anticipated from this conversion as these controllers control the irrigation for large areas of City-owned right of way, trails, facilities, parks, and community fields.

4.8.1.5 Programs to Assess and Manage Distribution System Water Loss

Since 2007 the City has replaced approximately 71 miles of pipeline in order to maintain reliability of the distribution system. However, in years prior, the City failed to replace the amount of pipeline when needed; creating a backlog of aged pipe that required extensive maintenance and repair. As a result of the aggressive water pipeline replacement program, water main leaks have reduced from 600 leaks to less than 200 per year. Additionally, the recent requirement to conduct annual water loss audits has resulted in the City's ability to identify areas needing improvement and develop plans to further reduce our water loss.

4.8.1.6 Water Conservation Program Coordination and Staffing Support

The City's water conservation program currently staffs two full-time employees and two part-time employees. One full-time staff person has been dedicated to water conservation since 2007. Since 2015, one additional full-time staff person and two part-time water waste investigators have been added to assist with implementing and enforcing water conservation mandates.

Efforts to implement these DMM's have been both significant and successful. Since implementation of State restrictions in 2014, the City has nearly tripled its water conservation budget. From 2015 to 2020, over $700,000 in rebates has been given to nearly 1000 customers. These incentives have allowed customers to convert over 7,000 high efficiency sprinkler heads, 350 high efficiency toilets, 200 WBIC's, 100 high efficiency washers and nearly 600,000 square feet of lawn. Additionally, since 2015 the City has had watering restrictions in place with active enforcement by our water waste investigators, which has resulted in the issuance of over 17,000 violations.

4.9 Adoption, Submittal, and Implementation

This section describes Redlands' process for adopting, submitting, and implementing the 2020 IRUWMP and Redlands' WSCP.

4.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that the 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to Redlands' public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within Redlands' service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the report was available for review.

Redlands provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4 Appendix D-2**.

4.9.2 Public Hearing and Adoption

Redlands held a public hearing on June 15, 2021 to hear public comment and consider adopting this 2020 IRUWMP and Redlands' WSCP.

As part of the public hearing, Redlands provided information on their baseline values, water use targets and compliance, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed Redlands the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

Redlands' adoption resolution for the 2020 IRUWMP and Redlands' WSCP is included in **Part 4 Appendix D-3**.

4.9.3 Plan Submittal

Redlands will submit the 2020 IRUWMP and Redlands's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. The 2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

4.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, Redlands will make the plan available for public review during normal business hours in the City's Municipal Utilities and

Engineering Department located at 35 Cajon Street, Suite 15 A, Redlands, California 92373, and by posting the plans on the City's website for public viewing.

4.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or Redlands' WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

CITY OF RIALTO

2020 IRUWMP

Part 2 Chapter 5

Rialto 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

5

RETAIL URBAN WATER MANAGEMENT PLAN

City of Rialto

This chapter describes information specific to the City of Rialto, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the City of Rialto's reporting requirements for 2020 under the UWMP Act.

IN THIS SECTION

5.1 System Description

Three different entities provide water service to different portions of the City of Rialto (City or Rialto): the City through its water system operator Rialto Water Services, LLC and Veolia Water West Operating Services, Inc. (Rialto Water Services/Veolia), the West Valley Water District (WVWD), and the Fontana Union Water Company (FUWC). Rialto municipal water system provides potable and recycled water to retail customers primarily within the City of Rialto and serves approximately one-half of the population of the City. The service area is essentially the incorporated portion of the City of Rialto located between Interstate 10 and State Route 210. The City's service area is shown in **Figure 5-1**. Rialto is a retail public water supplier that meets the definition of an urban water supplier with over 12,200 municipal water service connections in 2020.

The City of Rialto sits at the base of the San Bernardino Mountains in the interior valley known as the San Bernardino Valley and within the Santa Ana River Basin Watershed. The topography ranges from 1120 feet to a high of 1520 feet above sea level. Land use within the service area is principally composed of single and multi-family residences, a centralized business and commercial district, and some institutional and industrial areas. The City distributes its water through a 162-mile network of distribution mains with pipelines sizes ranging from 2 to 48 inches. The water system consists of three pressure zones and with subzones that provide sufficient water pressure to customers.

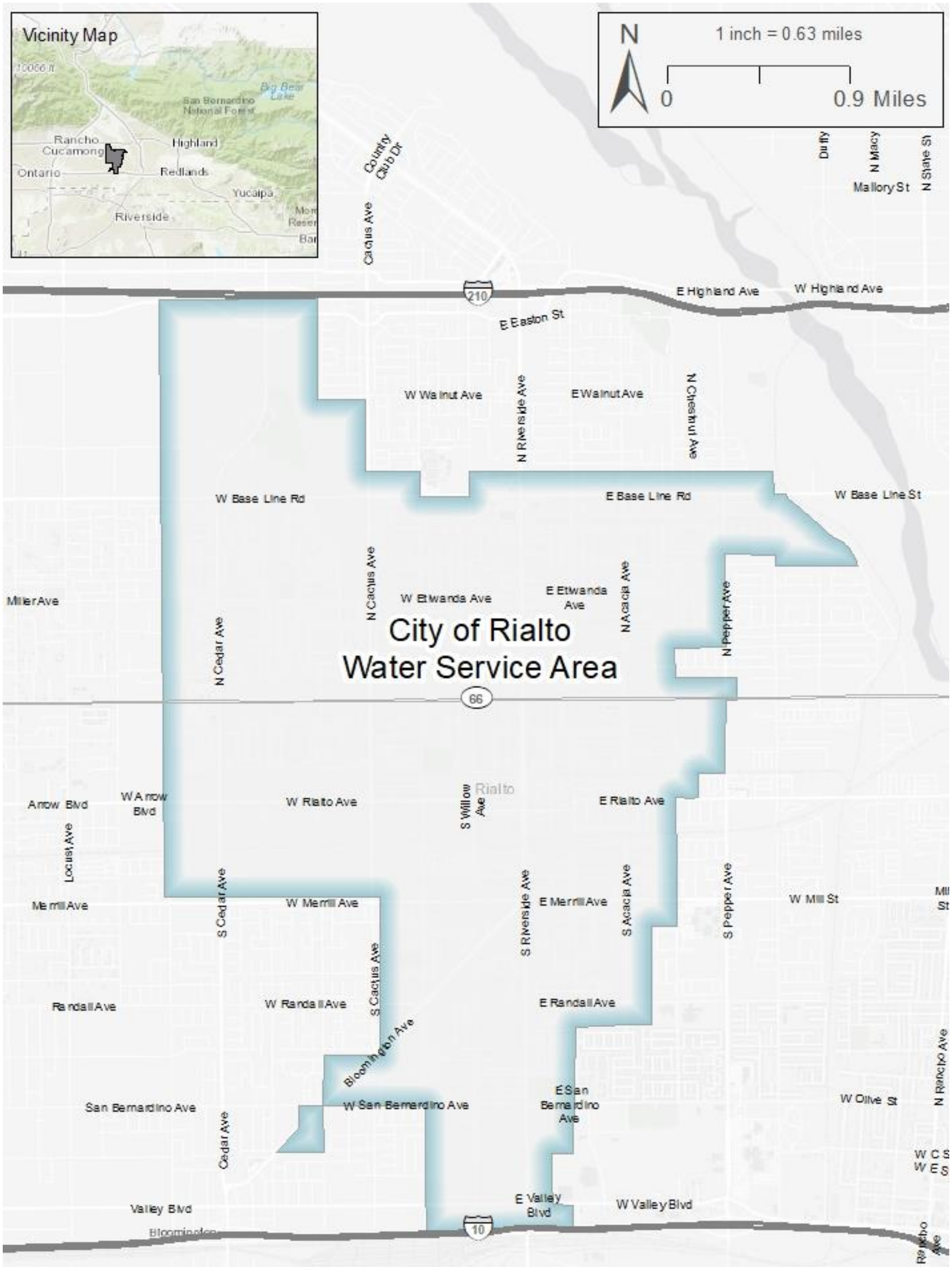


Figure 5-1: City of Rialto Water Service Area Map

This section describes the population and land uses within Rialto's service area. The regional climate, which includes Rialto's service area, is described in **Part 1, Chapter 2** of the 2020 IRUWMP.

5.1.1 Population

For the purposes of consistent reporting of population estimates, the California Department of Water Resources (DWR) has developed a GIS-based tool (DWR Tool) to estimate the population within a water agency's service area using census data and number of water service connections. The DWR Tool was used to intersect the service area boundary with census data to provide population estimates for 1990, 2000, and 2010. The DWR Tool uses the number of service connections in those prior census years, where available, to calculate a persons-per-connection factor, which is then projected forward to estimate population in a given year using the number of connections in that year. The service area population for 2020 was estimated in the DWR Tool using the number of connections in 2010 and 2020.

To estimate population for future years, projections from the Southern California Association of Governments (SCAG) were used. SCAG has developed a forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and in 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. The service area boundary was intersected with a GIS shapefile of the SCAG TAZs to provide an estimate of population within the service area for years 2020, 2035, and 2045. These estimates were used to calculate compound annual population growth rates for years 2020-2035 and 2035-2045. The population growth rates were applied to the 2020 population to estimate future population. Estimated 2020 and future year population is shown in **Table 5-1.**

Per SCAG requirements, it must be noted that this population modeling analysis was performed by Water Systems Consulting, Inc. based upon modeling information originally developed by SCAG. SCAG is not responsible for how the model is applied or for any changes to the model scripts, model parameters, or model input data. The resulting modeling data does not necessarily reflect the official views or policies of SCAG. SCAG shall not be held responsible for the modeling results and the content of the documentation.

Table 5-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**55,860**	**59,669**	**63,738**	**68,084**	**71,064**	**74,175**

5.1.2 Land Use

Per the 2010 City of Rialto General Plan, much of the land use within Rialto's Service Area is residential. Of the non-residential land use, 7% is commercial, 65% is industrial, 1% is public facilities, 3% is open space, and 24% is dedicated to specific plans.

SCAG prepares demographic forecasts based on land use data for their region through extensive processes that emphasizes input from local planners and is done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

5.2 Water Use

This section describes the current and projected water uses within Rialto's service area. Rialto serves potable water for domestic use and recycled water for irrigation. **Section 5.2** addresses potable water demand and provides for the reporting of raw water demand delivered for urban use for the year 2020. Recycled water is discussed in **Section 5.4**.

5.2.1 Water Use by Sector

Rialto categorizes its water customers into three categories for the purposes of billing: Residential, Commercial and Government. The number of active connections in each category from 2016 to 2020 are shown in **Table 5-2.** Residential connections include both single family and multifamily connections.

Table 5-2: City of Rialto 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	8,667	9,211	9,785	10,371	10,864
Commercial	823	908	990	1,120	1,208
Government	176	182	187	191	193
TOTAL	**9,666**	**10,301**	**10,962**	**11,682**	**12,265**

5.2.1.1 Past Water Use

Rialto's actual water use by customer class from 2016-2020 is shown in

Table 5-3**.** Rialto's water consumption by customer class in the last five years is shown in **Figure 5-2.** Approximately 74% of Rialto's total deliveries were to residential connections, followed by 18% to commercial customers, and the remainder to municipal customers.

Table 5-3: 2016-2020 Actual Water Use (AFY)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	5,334	5,644	5,721	5,666	6,112
Commercial	1,362	1,574	1,495	1,628	1,477
Government	659	701	751	653	727
Water Losses	915	654	785	6	614
TOTAL	**8,290**	**8,641**	**8,762**	**7,958**	**8,929**

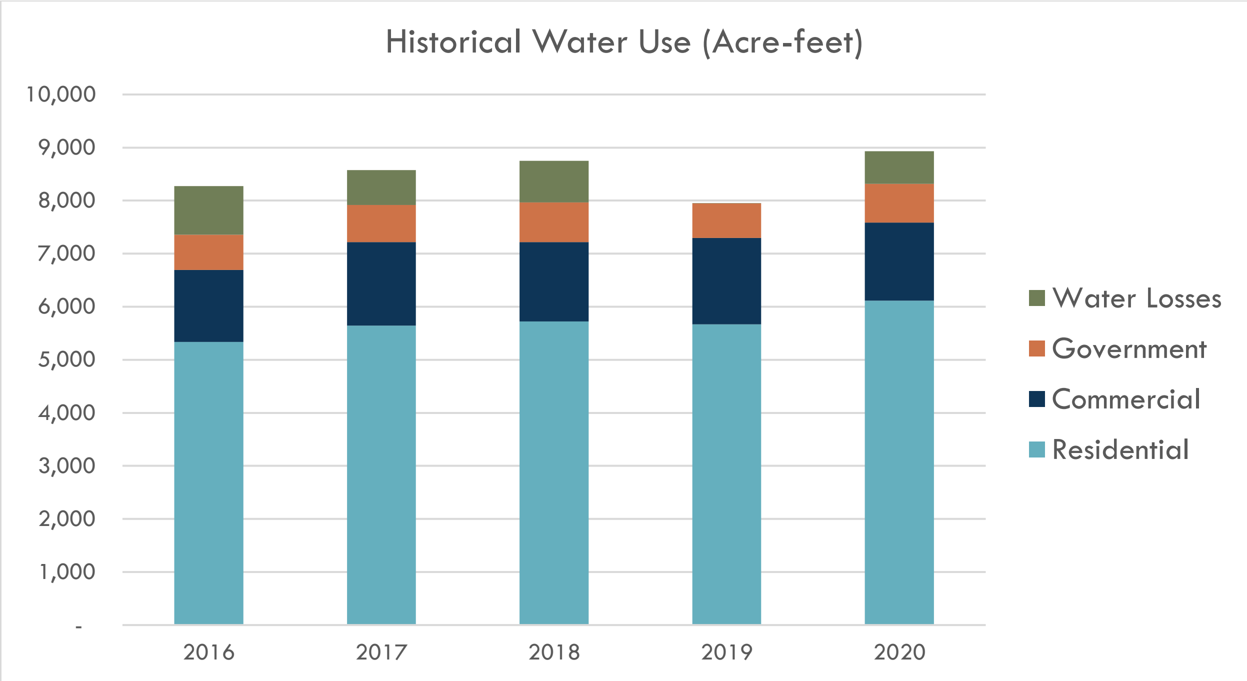


Figure 5-2: City of Rialto 2016-2020 Water Consumption by Customer Class

5.2.1.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water.

Sources of water loss include:

- **Leaks from water lines** - Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall water loss. Aging pipes typically have more leaks.
- **Water used for flushing and fire hydrant operations**
- **Unauthorized uses or theft of water**
- **Customer Meter Inaccuracies** - Customer meters can under-represent actual consumption in the water system.

Rialto monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4, Appendix E-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 5-4.** The 2020 water loss is estimated based on the difference between production and consumption for 2020.

Rialto will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 5-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		VOLUME OF WATER LOSS*
MM	YYYY	
1	2016	591
1	2017	434
1	2018	597
1	2019	330
1	2020	614 (Estimated)

The 2020 AWWA Water Audit is not yet available. The 2020 water loss is estimated based on the difference between production and consumption for 2020.

In the past 5 years, Rialto's water loss has ranged from 4% to 12% of water sales. For the purposes of future water use projections, water loss is assumed to be 8% of projected water sales.

Rialto is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standard that is being developed by the State Water Board. Rialto currently has an annual meter replacement program for leaking or broken meters and is in the process of calibrating all large meters in the distribution system. Additional discussion of programs to manage water loss is included in **Section 5.8.1.5.** These programs will increase the efficiency of the water distribution system by decreasing future water losses; however, water losses cannot be prevented entirely.

5.2.2 Projected Water Use

A demand forecast tool was developed to estimate future demands based on individual customer categories and connections, with the ability to forecast how future changes in indoor and outdoor water use may impact overall water use within each different customer type for current and future customers.

The tool has three steps to project demand:

1. Establish a demand factor per connection for each customer class based on historical consumption data.
2. Project the number of new connections anticipated for each customer class in each 5-year period after 2020.
3. Modify demand factors as appropriate to account for expected changes in future water use.

The demand factors for each customer class were based on connection and demand data from 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.

The resulting projection was compared to the City's knowledge of growth patterns within the service area and determined to be a reasonable projection of expected growth. Although redevelopment is expected to be ongoing within the service area, it is not expected to significantly impact water use since the City's service area is near "built-out" condition.

To estimate future water use for each customer category, the demand factor is multiplied by the number of estimated new connections and added to the 2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the total future water use. Projected future demands by customer class as well as estimated losses are presented in **Table 5-5**, **Table 5-6**, and **Figure 5-3.**

Table 5-5: DWR 4-2R Projected Demands for Water (AF)

- USE TYPE	ADDITIONAL DESCRIPTION	PROJECTED WATER USE 2025	2030	2035	2040	2045
Single Family	Residential	6,528	6,945	7,362	7,629	7,897
Commercial	Commercial	1,577	1,678	1,779	1,843	1,908
Institutional/Governmental	Government	776	826	876	907	939
Losses	Losses	711	756	801	830	860
	TOTAL:	**9,593**	**10,205**	**10,817**	**11,210**	**11,603**

Table 5-6: DWR 4-3R Total Gross Water Use (AF)

-	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	8,929	9,593	10,205	10,817	11,210	11,603
Recycled Water Demand* From Table 6-4R	-	10	10	10	10	10
Total Water Use:	**8,929**	**9,603**	**10,215**	**10,827**	**11,220**	**11,613**

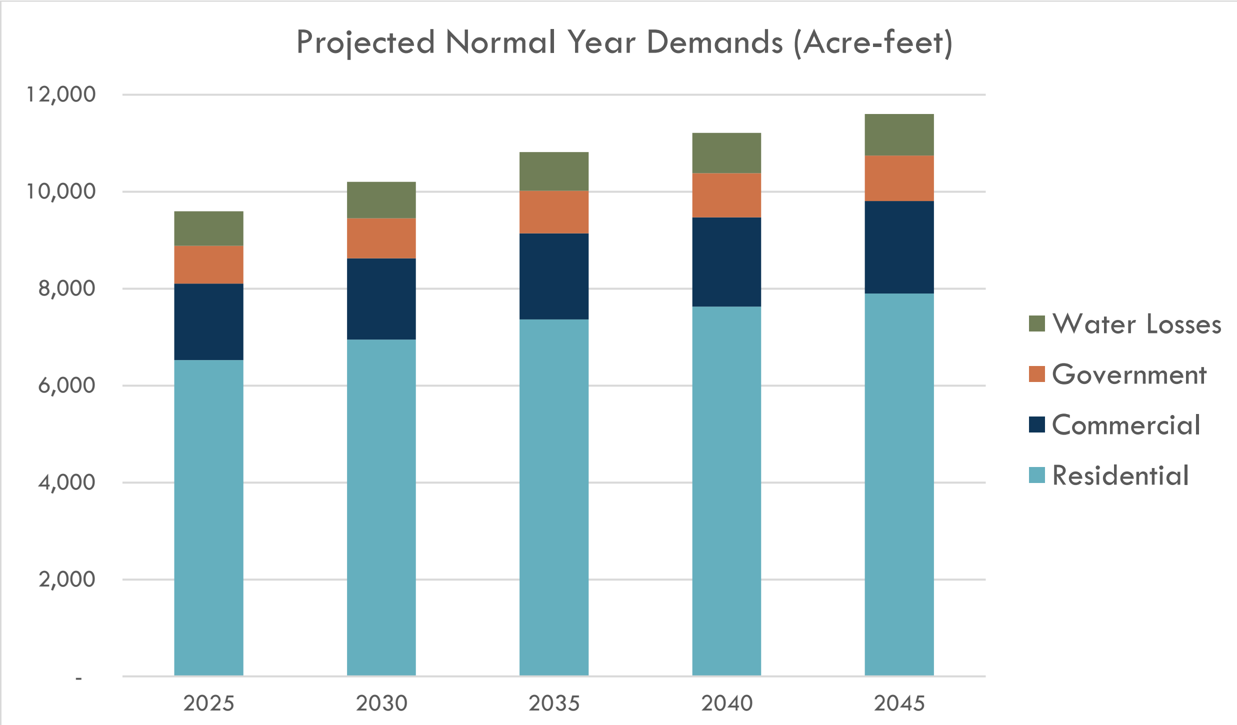


Figure 5-3: City of Rialto Projected Future Water Consumption by Customer Class

5.2.2.1 Estimating Future Water Savings

The demand tool used to project future water use has the capability to modify demand factors for both new and existing connections to quantify reductions in current and future customer demand that may occur as a result of active conservation programs implemented by Rialto or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. Rialto may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, Rialto has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of Rialto's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, Rialto will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. The City of Rialto is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

5.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires water use projections in an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. Based on SCAG's 6th cycle final regional housing needs allocation (RHNA), it is estimated that about 41 percent of all Rialto households qualify as lower income. It should be noted that approximately half of the City of Rialto is within the City's water service area, while the other half is served by WVWD and Fontana Union Water Company. However, a detailed breakdown of the household income categories within the water service area was not available; therefore, the City-wide estimate of 41 percent was used. These lower-income water demands have been included in future demand projections.

5.2.4 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

5.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets the City developed and demonstrates that compliance by 2020 was achieved.

Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for Rialto's calculations are included in **Part 4 Appendix E-7.**

5.3.1 Baseline and Target

Rialto's baseline and 2020 target was calculated in the 2015 RUWMP and has not changed for this plan. More details on the development of the baselines and target can be found in the 2015 RUWMP and **Part 4 Appendix E-7**. Rialto's calculated water use target for 2020 is 171 GPCD.

5.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, Rialto has met its Confirmed Water use Target for 2020 of 171 GPCD, as shown in **Table 5-7**. To maintain this level of water use, Rialto intends to continue its current level of outreach and programs for the foreseeable future.

Table 5-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
171	143	Yes

5.4 Water Supply

The City of Rialto municipal water system generally obtains supplies from the following different types of sources:

- Groundwater from four different adjudicated groundwater basins: the Rialto Basin, Lytle Creek Basin, North Riverside Basin and the Bunker Hill Basin. The City also receives additional Bunker Hill groundwater delivered through a shared delivery system called the Baseline Feeder.
- Surface water from canyon surface flows on the east side of the San Gabriel Mountains, including the North Fork Lytle Creek, Middle Fork Lytle Creek and South Fork Lytle Creek, which are treated at the Oliver P. Roemer Water Filtration Plant (Roemer). Roemer is owned and operated by the WVWD, and the City of Rialto has a 25% share of the original 6 mgd (1.5 mgd) portion of the Facility.
- Emergency stand-by agreements with the City of San Bernardino and Riverside-Highland Water Company.
- Recycled water is available from the City's Wastewater Treatment Plant.

More information about local surface water and groundwater basins is included in **Part 1, Chapter 3** of the 2020 IRUWMP.

5.4.1 Purchased or Imported Water

Rialto does not currently purchase imported SWP water or other supplies but does purchase SWP water for groundwater recharge and management.

5.4.2 Groundwater

Groundwater currently supplies the majority of Rialto's total supply, and the City will continue to rely on groundwater as its preferred source of supply, augmented with surface supplies when available. The City produces water from four different adjudicated groundwater basins: the Rialto Basin, Lytle Creek Basin, Riverside North Basin and the Bunker Hill Basin. Rialto participates in several ongoing water conservation measures and contributes to regional recharge projects through the San Bernardino Basin (SBB) Groundwater Council and Rialto Basin Groundwater Council to optimize and enhance the use and reliability of local groundwater water resources. Relevant portions of the adjudications and judgments that govern groundwater use are discussed in **Part 1, Chapter 3** of the 2020 IRUWMP.

5.4.2.1 San Bernardino Basin (or SBB, which includes Bunker Hill and Lytle Basins)

The City currently has one well in the Bunker Hill Basin, City Well #4A, and also is supplied Bunker Hill Basin groundwater produced and delivered through the Baseline Feeder. There are no restrictions on Rialto's extractions from the Bunker Hill Basin except within the area of the Lytle Creek Region and the City of San Bernardino's groundwater management zone, which restricts new or additional pumping. Restrictions on the City of Rialto's pumping rights from the Bunker Hill Basin are that all the water is to be used within the boundaries of the Valley District.

The City owns groundwater extraction rights in the Lytle Creek groundwater basin. The basin was adjudicated under the 1924 Judgment No. 17030 from the Superior Court of San Bernardino County and is based on the City's stock ownership in the Citizens Land and Water Company, the Lytle Creek Water and Improvement Company, and the companies that the City acquired which were named in the 1924 Judgment (Rialto Domestic Water, Rancheria Water Company and Mutual Water Company). The 1924 Judgment restricts the place of users and rate of extraction for the right to export out of the Lytle Creek Region. The Lytle Creek Region is comprised of the entire Lytle Creek Basin and some portions of the Bunker Hill Basin.

The Lytle Creek Groundwater Basin is highly porous and easily replenished during heavy precipitation years. Recharge for the basin is from storm runoff in the Lytle Creek watershed and from percolation of SWP Water by the SBVMWD. The depth of groundwater in the basin varies from 50 feet to 400 feet depending on whether the area is in a drought or wet cycle. Well production varies in the basin as the basin levels change from year to year. The City's long term water supply from the basin varies from 1,700 to 5,000 acre-feet per year. There is no known contamination within the basin and no contamination is expected in the future.

5.4.2.1.1 Baseline Feeder

In 1991 the City entered into a joint venture agreement with Valley District, WVWD and the Riverside Highland Water Company to construct the Baseline Feeder. The Baseline feeder is a 48- inch transmission main with a capacity of 60 mgd designed to transport water from the Bunker Hill basin west to the Rialto area. The City owns 33 percent of the pipeline from Meridian Avenue and Baseline Road to Cactus Avenue and Baseline Road. In 1991 the City and WVWD entered into an agreement with SBVMWD to participate in the financing of reaches one and two of the pipeline. In May of 2012, the City, WVWD, Riverside Highland Water Company and SBVMWD entered into a Restated and Amended Agreement for the Construction, and Operation and Maintenance of the New Baseline Feeder. This allowed for the construction of two new wells located in the Bunker Hill Basin and booster station. The City and WVWD were given the right to have access to 2,500 AFY and 5,000 AFY respectively, at an approximate operation and maintenance cost of $130 to 140 per acre foot for 20 years.

In 1991, the City entered into an agreement with WVWD to jointly construct and own a 1.0-million-gallon reservoir and booster station to boost water from the wells in the 9th Street and Lytle Creek Wash areas into the Baseline Feeder. The City has one-third ownership in the reservoir and booster station. The reservoir acts as a stilling well to remove entrapped air from the well discharges. City Well #4A pumps from the Bunker Hill basin directly into the reservoir and is the boosted into the Baseline Feeder for delivery to Rialto.

The City is also able to take delivery through the Baseline Feeder of water from the City of San Bernardino Municipal Water Department (SBMWD), if needed. This water is provided by SBMWD, up to 3,000 gpm, from the Newmark Groundwater Contamination Superfund Site. This water is considered surplus water by SBMWD, and it may be suspended when SBMWD needs the water to meet its own demands.

All water delivered through the Baseline Feeder is Bunker Hill groundwater and is included in the City's total Bunker Hill production for the purposes of this plan.

5.4.2.2 Rialto-Colton

The City of Rialto has groundwater extraction rights in the Rialto-Colton Basin. The basin was adjudicated under the 1961 Decree No. 81264 of the Superior Court of San Bernardino County, and is managed by the Rialto Basin Management Association (stipulated parties of the judgment). When the basin's three index wells (WVWD Well No. 11 and 13, and Rialto's Well 4) highest average mean groundwater level elevations is above 1002.3 feet when measured during March, April or May, the City has no restrictions on yearly extractions. The City has no restrictions on the rate of pumping per minute or day. When the highest average standing water levels in the three index wells falls below 1002.3 feet msl and is above 969.7 feet msl, the City is restricted to total groundwater extractions of 4,366 AFY. This extraction right is based on the City's listed rights in the decree, ownership of wells listed in the decree, stock ownership in the Citizens Land and Water Company and stock ownership in the Lytle Creek Water and Improvement Company. The extraction rights listed in the 1961 decree total 15,290 AFY.

When the average of the three index wells drops below 969.7 feet msl, ground water extractions are reduced for all parties stipulated in the decree by 1 percent per foot below the 969.7-foot level, but not to exceed 50-percent reduction. For 2020, the groundwater levels in the index wells led to a 29-percent reduction in allowable production.

Several other entities also withdraw water from the Rialto Basin. The Fontana Union Water Company (FUWC) has one well located within the basin, but was omitted from the adjudication decree. In 2018, the City, Valley District, FUWC and Cucamonga Valley Water District entered into a Settlement Agreement that resulted in FUWCs No Man's Land production of 5,014 acre feet/year will be counted as part of the Rialto Basin production limits in the 1961 decree. These parties also agreed to form a Rialto Basin Groundwater Council (Rialto Basin GC), which was formed in 2021. The Rialto Basin GC will develop, adopt and implement a sustainable groundwater management plan, which will include implementing groundwater recharge projects to restore groundwater levels.

The City has entered into an agreement with the County of San Bernardino to lease 1,600 AFY of its water rights during drought conditions in order to allow the San Gabriel Valley Water Company (SGVWC) to extract and remove VOC's from the contaminant plumes. A separate agreement provides Rialto with funding to drill a new well to make up for the lost supply.

The City has a total water right allocation in the Rialto Basin of 4,366 AFY, including 1,520 AFY that are fixed rights and 2,846 AFY that are adjustable and subject to a percent reduction each year based on groundwater levels in the index wells. Over the previous 10 years, the average percent reduction has been nearly 30 percent, and was 29 percent in 2020. For the purposes of this plan, the City and the other agencies who pump from the Rialto Basin are assuming a 30-percent reduction in adjustable rights in 2025 and a 2% gain in adjustable rights for every 5-year period thereafter based on planned recharge to increase water levels and adjustable rights.

> For 2025, the City's average water supply from the Rialto Basin is expected to be 1,912 AFY (1,520 AFY fixed plus 2,846 AFY reduced by 30 percent, minus 1,600 AFY for SGVWC). By 2045, the average water supply is assumed to increase to 2,140 AFY. The City's rights will increase by an additional 1,600 AFY once the lease with SGVWC ends.

Extractions from the Rialto Basin have been limited in recent years due to groundwater contamination plumes of volatile organic compounds (VOC) from the Mid Valley Landfill and perchlorate from abandoned rocket fuel plants in the northern parts of the City. A groundwater treatment program is in place to extract and remove VOC's and perchlorate from the groundwater basin there by resorting the City's ability to have access to all of their Rialto Basin rights.

5.4.2.3 Riverside North

The City has one well, Chino 2, that produces from the Riverside North Basin. This basin was discussed further in **Part 1 Chapter 3**.

The City of Rialto's historical production for the past five years is shown in **Table 5-8**.

Table 5-8. DWR 6-1R Groundwater Pumped Last Five Years (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	SBB (Bunker Hill)	1,963	514	1,268	912	1,508
Alluvial Basin	SBB (Bunker Hill via Baseline Feeder)	1,478	1,625	1,827	1,740	1,668
Alluvial Basin	SBB (Lytle)	1,332	2,130	2,143	1,252	999
Alluvial Basin	Rialto-Colton	1,113	1,456	1,818	1,543	2,015
Alluvial Basin	Riverside-Arlington	1,389	1,608	694	1,110	1,156
-	**TOTAL:**	**7,275**	**7,333**	**7,749**	**6,557**	**7,346**

5.4.3 Surface Water

The City of Rialto has a total of 115.63 miner's inches (1.0 miners inch =9.0 gpm) or 1,040.67 gallons per minute of surface water diversion rights in Lytle Creek. The surface water diversion rights for Lytle Creek were determined in the 1897 McKinley Decree entered in Los Angeles Superior Court Case No. 20,790. The City of Rialto owns 21.98% of the shares of the Lytle Creek Water & Improvement Company. The Lytle Creek Water & Improvement Company realized a total of 329.39 miner's inches from the decree. The City obtained 72.4 miners inches from its stock shares in the Lytle Creek Water & Improvement Company. The City also obtained an additional 43.23 Miners inches of Lytle Creek surface water diversion rights when the City purchased the Rialto Domestic Water Company.

The City utilizes all of its surface water diversion rights in Lytle Creek through its ownership of 1.5 mgd of capacity in the Oliver Roemer Water Filtration Facility that WVWD owns and operates. The surface water from Lytle Creek is diverted by Southern California Edison at the mouth of Lytle Creek Canyon to generate electrical power at its Fontana Power Plant located on the east side of Riverside Avenue at the intersection of Linden Avenue. WVWD bills the City for its portion of the WFF operation and maintenance costs.

When the flows at the mouth of Lytle Creek Canyon drop below 7,182 gpm (798 miners inches), all diversion rights holders must reduce their diversions to a prorated schedule set in the 1897 decree. If the City is not receiving its full Lytle Creek surface water allotment, they are permitted to make up the difference by additional pumping in the Lytle Creek Region, which is part of the SBB.

5.4.4 Stormwater

Rialto is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the basins Rialto produces water from. These regional projects are discussed in **Part 1 Chapter 3.**

5.4.5 Wastewater and Recycled Water

Rialto through its operator, Rialto Water Services LLC/Veolia Water West Operating Services, Inc., maintains and operates the City of Rialto wastewater collection system and treatment plant. All of the wastewater flows from the City is collected by the City's local sewer mains and delivered to the Rialto Wastewater Treatment Plant. Currently the Rialto Wastewater Treatment Plant also collects, treats, and disposes of the wastewater from the WVWD service area and some areas of the City of Fontana through Extra-Territorial Agreements. Currently the City's WWTP is permitted for 11.7 mgd of treatment capacity and treats an average of 7 MGD as of 2020.

> It is estimated that approximately 43% or 3 mgd of the wastewater collected at the City of Rialto WWTP was generated within Rialto's water service area in 2020.

5.4.5.1 Potential, Current, and Projected Recycled Water Uses

The Rialto Wastewater Treatment Plant is a Grade V plant with tertiary treatment that discharges its treated wastewater to serve landscape irrigation purposes and to the Santa Ana River. The City maintains a recycled water network using effluent from its wastewater treatment plant. The current recycled water use is approximately 10 AFY for freeway landscape irrigation, with future expansion for park irrigation.

Information about wastewater collected and treated is presented in **Table 5-9** and **Table 5-10.**

Rialto plans to reduce the amount of treated effluent that is discharged from the Rialto Wastewater Treatment Plant into the Rialto Channel, which is a tributary to the Santa Ana River. The reduction of flow would occur in two parts as infrastructure is constructed, demand for recycled water increases, and certain habitat modifications are implemented within the Rialto Channel. The City of Rialto would recycle/reuse the wastewater by transporting treated wastewater through a pipeline system to recycled water consumers within their service area for direct application.

Table 5-9. DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
City of Rialto	Estimated	3,479	City of Rialto	Rialto WWTP	Yes	Yes
	TOTAL:	**3,479**				

Table 5-10. DWR 6-3R Wastewater Treatment and Discharge within Service Area in 2020

							2020 VOLUMES				
WASTEWATER TREATMENT PLANT NAME	DISCHARGE LOCATION NAME OR IDENTIFIER	DISCHARGE LOCATION DESCRIPTION	WASTEWATER DISCHARGE ID NUMBER	METHOD OF DISPOSAL	PLANT TREATS WASTEWATER GENERATED OUTSIDE THE SERVICE AREA	TREATMENT LEVEL	WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIREMENT
Rialto WWTP	Rialto Drain	Santa Ana River		River or Creek	Yes	Tertiary	8115	8115			
						TOTAL:	**8115**	**8115**			

5.4.6 Water Exchanges and Transfers

Rialto does not anticipate regular or long-term transfers or exchanges, during the period covered by this Plan. Any transfer or exchanges would be as-needed related to an emergency.

5.4.6.1 Emergency Interties

The City has emergency stand-by agreements with the City of San Bernardino, WVWD and Riverside-Highland Water Company to meet needs on a short-term basis.

The City has mutual aid agreements with the City of San Bernardino, Fontana Water, RHWC, and WVWD.

5.4.6.2 Future Water Projects

The City is currently conducting a Water Master Plan to identify necessary upgrades to its water distribution system. These projects are intended to increase the reliability of the City's system; they are not intended to create new sources of supply.

As part of the Rialto Basin GC, the City plans to collaborate with the other parties to implement groundwater recharge in the Rialto Basin to increase water levels. Increase water levels will result in an increase in the City's allowable pumping from the Rialto Basin, thereby increasing supply. The Rialto Basin GC will be developing a groundwater management plan that will identify recharge goals and projects and the potential supply increase is not yet quantified.

5.4.7 Summary of Existing and Planned Sources of Water

Rialto's water supply is comprised primarily of local groundwater, supplemented by local surface water when available. The City serves a small amount of recycled water for landscape irrigation. This same mix of supplies is anticipated to be used in the future.

As discussed in **Part 1 Chapter 5**, Rialto is applying a Reliability Factor of 15% to their supply reliability analysis to account for uncertainties in supply and demand projections. The 15% value is recommended in a study by the RAND Corporation that evaluated uncertainty factors in the regional supplies and demands, including population growth, per capita water use, climate change impacts on supplies and demands, SWP project supplies and local surface water supplies. See **Part 1 Chapter 5** for more details on how the Reliability Factor was established.

For the purposes of supply projections in this 2020 IRUWMP, Rialto is using the 15% Reliability Factor to establish a supply target of 15% more than total projected demand.

The volume of water utilized from each source in 2020 is summarized in Table 5-11 and projected supply by source is summarized in Table 5-12.

Table 5-11. DWR 6-8R Actual Water Supplies in 2020 (AF)

		2020		
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	Rialto-Colton	2,015	Drinking Water	See Note
Groundwater (not desalinated)	Riverside North	1,156	Drinking Water	See Note
Groundwater (not desalinated)	Bunker Hill (part of SBB)	1,508	Drinking Water	See Note
Groundwater (not desalinated)	Bunker Hill via Baseline Feeder (part of SBB)	1,668	Drinking Water	See Note
Groundwater (not desalinated)	Lytle (part of SBB)	999	Drinking Water	See Note
Surface Water (not desalinated)	Lytle Creek (part of SBB)	1,583	Drinking Water	See Note
Recycled Water	Rialto WWTP	-	Recycled Water	See Note
-	**Total:**	**8,929**		**-**

See Part 1, Chapter 3 for discussion of safe yield of regional groundwater basins

Table 5-12. DWR 6-9R Projected Water Supplies (AF)

		PROJECTED WATER SUPPLY				
		2025	2030	2035	2040	2045
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	Bunker Hill (part of SBB)	2,580	3,227	3,875	4,270	4,665
Groundwater (not desalinated)	Bunker Hill (via Baseline Feeder)	2,500	2,500	2,500	2,500	2,500
Groundwater (not desalinated)	Lytle (part of SBB)	1,600	1,600	1,600	1,600	1,600
Groundwater (not desalinated)	Rialto-Colton	1,528	1,557	1,586	1,614	1,642
Purchased or Imported Water	State Water Project - Rialto Colton Groundwater Supplemental Supply	384	412	440	469	498
Groundwater (not desalinated)	Riverside-Arlington	1,200	1,200	1,200	1,200	1,200
Surface water (not desalinated)	Lytle Creek	1,241	1,241	1,241	1,241	1,241
Recycled Water	Rialto WWTP	10	10	10	10	10
	TOTAL:	**11,043**	**11,747**	**12,451**	**12,903**	**13,355**

Supplies shown in this table are planned pumping or diversions, except supplies from San Bernardino Basin are increased to meet the Total Supply Target with 15% Reliability Factor.

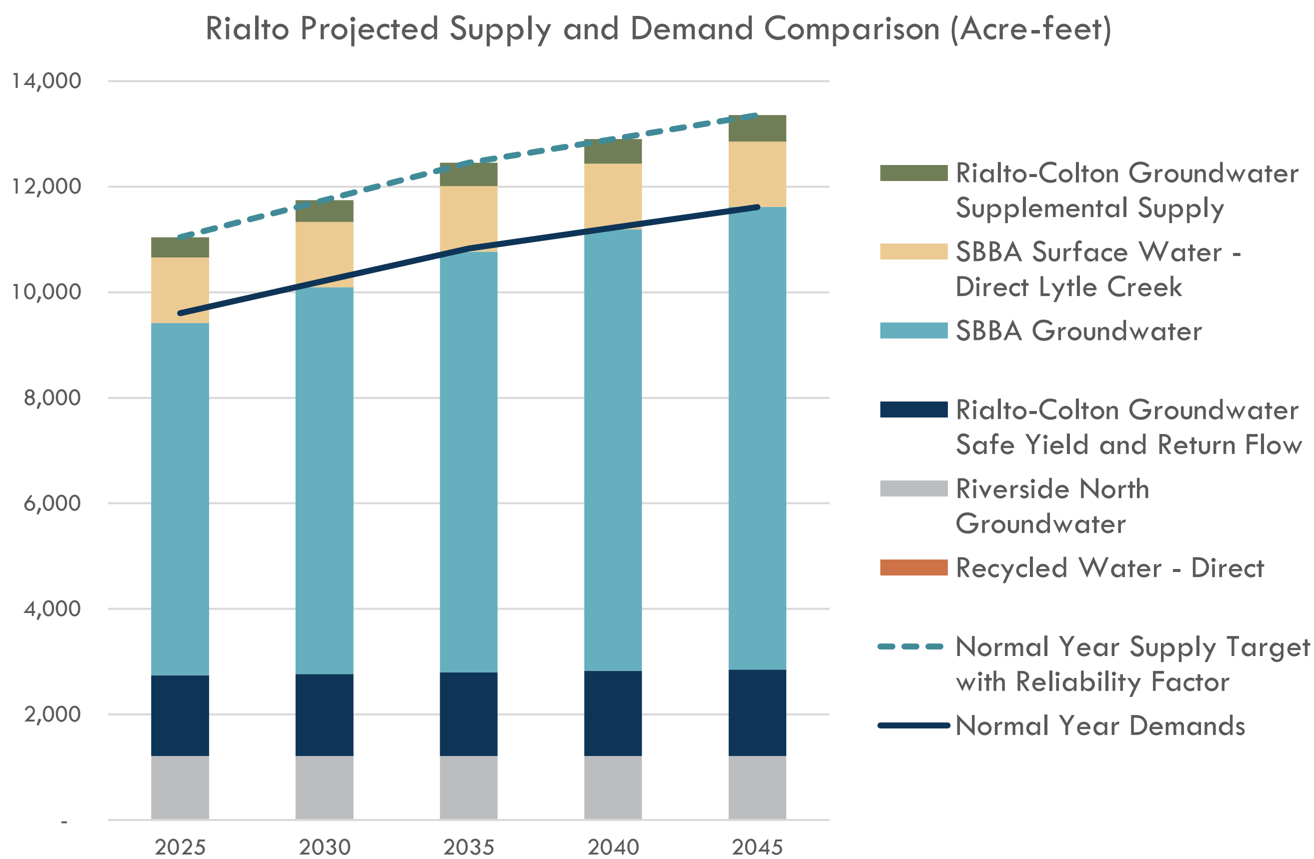


Figure 5-4: City of Rialto Projected Supply and Demand Comparison (AF)

Table 5-13. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	11,043	11,747	12,451	12,903	13,355
Demand Totals From Table 4-3R	9,603	10,215	10,827	11,220	11,613
Difference:	**1,440**	**1,532**	**1,624**	**1,683**	**1,742**

5.4.8 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2020, Rialto consumed a total of 611.5 kWh of energy per AF for all water facilities.

5.5 Water Service Reliability Assessment

This section considers Rialto's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from Rialto's current source of supply through 2045.

5.5.1 Constraints on Water Sources

Plumes of various chemical pollutants have been detected in local groundwater basins requiring the installation of well head treatment systems or blending. Rialto's Perchlorate Contamination Zero Tolerance Policy resulted in taking wells out of service which tested positive for detectible levels of perchlorate. Clean up efforts are through agreement with San Bernardino County and Emhart, responsible parties for the contamination, in coordination with the EPA and the Santa Ana Regional Water Quality Control Board will provide a remedy of the groundwater treatment within the Rialto-Colton Basin. Based on current conditions and treatment facilities, water quality is not expected to affect Rialto's supply reliability. However, water quality issues are constantly evolving. Rialto will take action to protect and treat supplies when needed, though water quality treatment is known to have significant costs. These water quality issues are further discussed at a regional level in **Part 1 Chapter 3**.

The City of Rialto is located in a semi-arid environment. The local groundwater and surface water supplies are influenced by annual precipitation. In extended drought conditions, the surface water supplies in the Lytle Creek region can be severely impacted. In addition, groundwater levels in the Lytle Creek Basin have been known to drop over 300 feet during extended drought periods. As a result, the City is vulnerable to water shortages due to seasonal hot weather and climatic influences.

The City's pumping rights in the Rialto Basin are determined by groundwater levels. While the City and the Rialto Basin GC plan to recharge the basin to increase water levels, the City's pumping rights could be reduced if groundwater levels decline.

The City can shift production to the Bunker Hill basin if needed and will be required to contribute to recharge through the SBB GC to maintain reliable supplies in that basin.

5.5.2 Year Type Characterization

In general, groundwater is 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 BTAC, monitor groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in **Part 1, Chapter 3.**

Per UWMP requirements, Rialto has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition 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.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

5.5.3 Water Service Reliability

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. 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% increase throughout the 5-year drought to be conservative.

As described in **Part 1, Chapter 3,** the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. While pumping rights from the Rialto Basin and available surface water may be reduced in dry years, Rialto is able to pump additional groundwater from Bunker Hill, Lytle and Riverside North to meet total demands in dry years and participates in efforts to replenish the basins with imported and local water through regional recharge programs. Rialto's total groundwater supplies are not reduced in dry years so 2020 is considered the base year for all year types. Based on the analysis, Rialto does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, Rialto participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. Rialto also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 5-14**. The percent of average supply increases in drought years because Rialto's groundwater production will increase to meet an assumed increase in demands.

The results of the reliability assessment are summarized in the following tables.

Table 5-14. DWR 7-1R Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS PERCENT OF AVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a normal year are shown in **Table 5-13.**

The projected supply and demand during a single dry year are shown in **Table 5-15**. Rialto's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basins Rialto produces water from have storage for use in dry years so Rialto can produce the volume of water needed to meet 100% of demands in single dry years. Rialto's supplies are 100% reliable during single dry years.

Table 5-15. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals	12,147	12,922	13,696	14,194	14,691
Demand Totals	10,562	11,235	11,909	12,341	12,774
Difference:	**1,584**	**1,685**	**1,786**	**1,851**	**1,916**

The projected supply and demand during five consecutive dry years are shown in **Table 5-16**. Rialto's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins Rialto produces water from have storage for use in dry years so Rialto can produce the volume of water needed to meet 100% of demands in multiple dry years. Rialto's supplies are 100% reliable during multiple dry years.

Table 5-16. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
FIRST YEAR	Supply Totals	12,147	12,922	13,696	14,194	14,691
	Demand Totals	10,563	11,236	11,910	12,342	12,775
	Difference:	**1,584**	**1,685**	**1,786**	**1,851**	**1,916**
SECOND YEAR	Supply Totals	12,147	12,922	13,696	14,194	14,691
	Demand Totals	10,563	11,236	11,910	12,342	12,775
	Difference:	**1,584**	**1,685**	**1,786**	**1,851**	**1,916**
THIRD YEAR	Supply Totals	12,147	12,922	13,696	14,194	14,691
	Demand Totals	10,563	11,236	11,910	12,342	12,775
	Difference:	**1,584**	**1,685**	**1,786**	**1,851**	**1,916**
FOURTH YEAR	Supply Totals	12,147	12,922	13,696	14,194	14,691
	Demand Totals	10,563	11,236	11,910	12,342	12,775
	Difference:	**1,584**	**1,685**	**1,786**	**1,851**	**1,916**
FIFTH YEAR	Supply Totals	12,147	12,922	13,696	14,194	14,691
	Demand Totals	10,563	11,236	11,910	12,342	12,775
	Difference:	**1,584**	**1,685**	**1,786**	**1,851**	**1,916**

5.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because Rialto has access to groundwater basins with significant storage, total available supplies do not vary on a monthly or seasonal basis, so this analysis is conducted on an annual basis. Projected demands and supplies from 2021-2025 are shown in **Table 5-17.**

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. This DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in Section 5.5 and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for Rialto. Rialto can produce additional groundwater to meet any increases in demand in dry years.

Table 5-17: DWR 7-5 Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	10,287
	Total Supplies	11,830
	Surplus	**1,543**
2022	Gross Water Use	10,752
	Total Supplies	12,365
	Surplus	**1,613**
2023	Gross Water Use	11,217
	Total Supplies	12,900
	Surplus	**1,683**
2024	Gross Water Use	11,682
	Total Supplies	13,435
	Surplus	**1,752**
2025	Gross Water Use	12,147
	Total Supplies	13,969
	Surplus	**1,822**

5.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that Rialto 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 a number of reasons, such as water supply 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 Rialto 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 Rialto maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. Rialto's WSCP is attached as Part 4 Appendix E-9.

5.8 Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that Rialto has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. Rialto's current per-capita consumption is less than its 2020 compliance target. Rialto expects to continue to implement current conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

5.8.1 Existing Demand Management Measures

In September 2009 the City of Rialto joined the California Urban Water Conservation Council and has implemented a number of the DMMs defined in the act. Rialto has not developed a Best Management Practice Report to accompany this Plan. The following Section identifies the water demand management measures currently implemented or scheduled for implementation by Rialto. Water in the City of Rialto is provided by the City, Fontana Water Company and WVWD. Water conservation programs and incentives offered by the City will only benefit their customers. In order to effectively implement water conservation programs, Rialto would need to collect data for the user within the Rialto Water Service area only. Rialto recognizes that these measures are important for the reliability of its water sources and has made a continued effort to comply with the DMMs required by the act.

5.8.1.1 Water Waste Prevention Ordinances

The City Ordinance Number 1560 Chapter 12.20: Water Conservation Requirements included in Appendix G outlines efficient water use measures and four stages of increasingly restrictive prohibition with related penalties for non-compliance. The goal of this ordinance is to outline restrictions put in place to help the City of Rialto reduce potable water consumption by 26 percent compared to 2013.

5.8.1.2 Metering

All existing and new water services are metered throughout the Rialto water service area. A water meter calibration and replacement program is in place to continually improve accurate meter readouts. New services, with the exception of single-family residences and apartment complexes up to and including four units per meter, are required to install a separate water meter for the on-site landscaping.

5.8.1.3 Conservation Pricing

The conservation tiered rate structure used by Rialto, where efficient water use is billed at a low price and higher water use billed at progressively higher prices provides the economic incentives to customers to use water efficiently.

5.8.1.4 Public Education and Outreach

At the local level, Rialto provides outreach communication and information regarding conservation efforts, rebates and incentives to its customers through water bill inserts, direct mailers, newsletters, door hangers, direct phone calls, emails, websites, social media, business partnerships, quarterly Rialto Progress Magazine, community forums, educational programs, and information booths at fairs, public events, and water walk events. On an annual basis Rialto's water operator, Rialto Water Services/Veolia, holds an open house event that invites local school children and parents to participate in an all-day event promoting water conservation and educating the public in general on water issues. The customer's monthly bill includes a consumption usage chart that compares to prior years in an easy-to-understand format, informing customers of progress towards conservation targets.

5.8.1.5 Programs to Assess and Manage Distribution System Real Losses

Rialto has an active Visible Leak Detection Program to decrease leak response times and minimize water loss throughout the water distribution system. Leaks are generally repaired within two days of discovery. Three field meter reader and two production operator employees staff the program five days per week. Meter readers are required to inspect elements in the water distribution system as they travel respective routes throughout the city. This includes meter boxes, fire hydrants, air-vacuum units, above ground piping and appurtenances. They also look for signs of leaks in soil and paved areas in the routes. Two production operators also check wells, tanks, booster pumps and appurtenant equipment for leaks each day of the business week. The leak detection activity is conducted as part of routine duties assigned and imbedded in the operations routine activities.

5.8.1.6 Water Conservation Program Coordination and Staffing Support

The Water Conservation Program, an active program to encourage efficient use of Rialto's Water Resources is a coordinated effort throughout Rialto's services area. One staff coordinates conservation programs, including outreach, and education programs. This staff person also oversees the rebates, incentive programs, customer services assistance to administer collections of water waste reports and enforcement of non-compliance by water customers to the current water conservation stage coordination with new development, conditions and enforce the use of water efficient measures. The program has sponsored landscaping classes for the community taught by professionals to promote more drought tolerant landscaping. The program is administered and funded through the operations.

5.8.1.7 Other Demand Management Measures

Rebates, incentives and giveaways are offered to all water customers promoting efficient use of Rialto's Water Resources. Current rebates offered to all customers include installation of high efficiency toilets, high efficiency washing machines, weather based smart irrigation timers, automatic shut off nozzle and turf replacement.

5.9 Adoption, Submittal and Implementation

This section describes Rialto’s process for adopting, submitting, and implementing the 2020 IRUWMP and Rialto’s WSCP.

5.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to Rialto’s public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within Rialto’s service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

Rialto provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in Part 4 Appendix E-2.

5.9.2 Public Hearing and Adoption

Rialto held a public hearing on June 22, 2021 to hear public comment and consider adopting this 2020 IRUWMP and Rialto’s WSCP.

As part of the public hearing, the Rialto provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed Rialto the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

Rialto’s adoption resolution for the 2020 IRUWMP and Rialto’s WSCP is included in Part 4 Appendix E-3.

5.9.3 Plan Submittal

Rialto will submit the 2020 IRUWMP and Rialto’s WSCP to DWR, the State Library, and cities and counties within 30 days after adoption.

2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

5.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, Rialto will make the plan available for public review during normal business hours by placing a copy of the 2020 IRUWMP and Rialto's WSCP at the front desk of the City's office, and by posting the plans on the City's website for public viewing.

5.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or Rialto's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

EAST VALLEY WATER DISTRICT

2020 IRUWMP

Part 2 Chapter 6

EVWD 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

WSC

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

6 RETAIL URBAN WATER MANAGEMENT PLAN
East Valley Water District

This chapter describes information specific to the East Valley Water District, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the East Valley Water District's reporting requirements for 2020 under the UWMP Act.

6.1 System Description

East Valley Water District (EVWD or District) is a California Special District, established in 1954, that provides water and wastewater services. EVWD encompasses 30.1 square miles along the foothills of the San Bernardino Mountains and serves the City of Highland, portions of the City and County of San Bernardino, along with the San Manuel Band of Mission Indians. As a district tasked with managing a critical resource, EVWD is committed to innovative leadership and world class public service. The District's service area is shown in **Figure 6-1**. EVWD is a retail public water supplier that meets the definition of an urban water supplier with over 21,600 municipal water service connections in 2020.

IN THIS SECTION

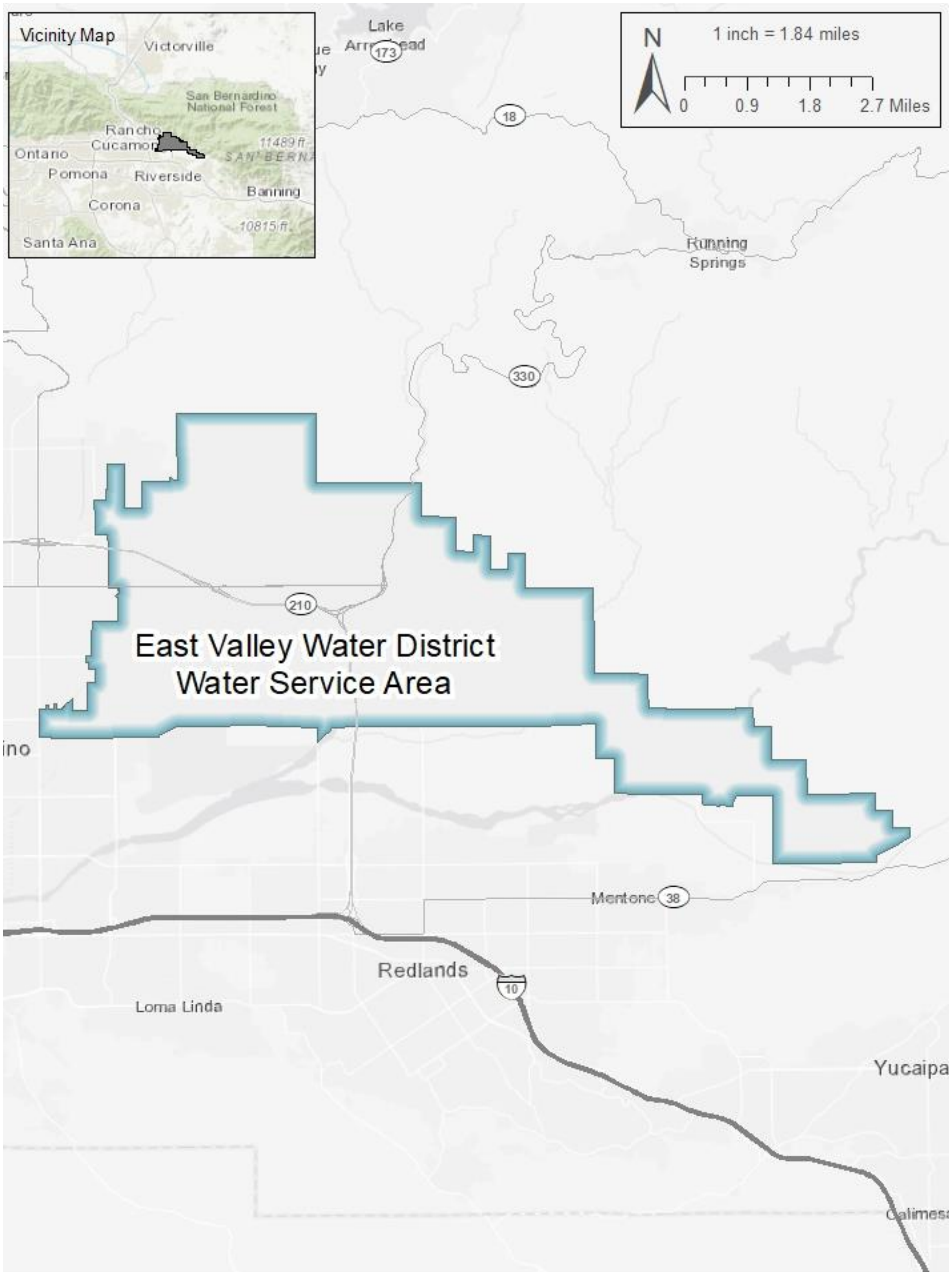


Figure 6-1: EVWD Service Area Map

6.1.1 Population

For the purposes of consistent reporting of population estimates, the California Department of Water Resources (DWR) has developed a GIS-based tool (DWR Tool) to estimate the population within a water agency's service area using census data and number of water service connections. The DWR Tool was used to intersect the service area boundary with census data to provide population estimates for 1990, 2000, and 2010. The DWR Tool uses the number of service connections in those prior census years, where available, to calculate a persons-per-connection factor, which is then projected forward to estimate population in a given year using the number of connections in that year. The service area population for 2020 was estimated in the DWR Tool using the number of connections in 2010 and 2020.

Based on a thorough analysis of Census blocks within the service area, EVWD reported an estimated population of 103,000 in their 2019 Consumer Confidence Report. However, for purposes of this report, the DWR Tool output of 99,347 was assumed to be the official estimate of population in 2020 and serves as the basis for SBx7-7 compliance calculations and its future population projections years.

To estimate population for future years, projections from the Southern California Association of Governments (SCAG) were used. SCAG has developed a forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and in 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. The service area boundary was intersected with a GIS shapefile of the SCAG TAZs to provide an estimate of population within the service area for years 2020, 2035, and 2045. These estimates were used to calculate compound annual population growth rates for years 2020-2035 and 2035-2045. The population growth rates were applied to the 2020 population to estimate future population. Estimated 2020 and future year population is shown in **Table 6-1**. The 2025 population was adjusted upwards to account for known developments planned for construction by 2025, and all subsequent population projections were based on the 2025 population projection.

Per SCAG requirements, it must be noted that this population modeling analysis was performed by Water Systems Consulting, Inc. based upon modeling information originally developed by SCAG. SCAG is not responsible for how the model is applied or for any changes to the model scripts, model parameters, or model input data. The resulting modeling data does not necessarily reflect the official views or policies of SCAG. SCAG shall not be held responsible for the modeling results and the content of the documentation.

SCAG prepares demographic forecasts based on land use data for their region through extensive processes that emphasizes input from local planners and is done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Table 6-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**99,347**	**104,500**	**108,224**	**112,080**	**115,792**	**119,626**

6.1.2 Land Use

Per the 2019 EVWD Water System Master Plan, 30% of land within the service area is Single Family Residential, 4% is Multi-Family Residential, 3% is Commercial, 1% is Industrial, 5% is Public, 1% is Parks, 9% is Open Land, 3% is Agricultural, and 44% is Vacant.

6.2 Water Use

This section describes the current and projected water uses within EVWD's service area. EVWD serves only potable water for domestic use.

6.2.1 Water Use by Sector

EVWD categorizes its water customers into six categories for the purposes of recording water use and billing: Residential, Multi-Family, Commercial, Irrigation Commercial, Fire Service, and Bulk Water. The number of active connections in each category from 2016 to 2020 are shown in **Table 6-2**. There are no permanent service connections designated as Bulk Water; this is water used for construction purposes from temporary meters.

Table 6-2: EVWD 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	19,500	19,526	19,526	19,883	19,898
Multi-Family	463	463	463	474	475
Commercial[1]	949	988	988	681	694
Irrigation Commercial	275	275	275	322	330
Fire Service[2]	1,330	1,339	361	252	258
TOTAL	**22,517**	**22,591**	**21,613**	**21,612**	**21,655**

[1]Decrease in commercial connections between 2018 and 2019 was due to a change in billing classification, reclassifying these customers as Residential.

[2]Between 2017 and 2018, a change in District policy was made to not bill residential customers that had a separate fire service meter. The actual number of connections did not change.

6.2.1.1 Past Water Use

EVWD's actual water use by customer class from 2016-2020 is shown in **Table 6-3.** EVWD's water consumption by customer class in the last five years is shown in **Figure 6-2.** Approximately 60% of EVWD's total deliveries were to single family residential connections, followed by 19% to multi-family connections, 11% to commercial connections, 10% to commercial irrigation connections, and the remainder to fire service and bulk water sales.

Table 6-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	9,142	9,602	9,944	9,470	10,589
Multi-Family	3,070	3,301	3,452	3,340	3,377
Commercial	1,815	1,900	2,094	1,968	1,873
Irrigation Commercial	1,717	1,812	1,914	1,602	1,725
Fire Service	10	5	3	3	3
Bulk Water	78	85	92	83	143
Water Losses	1,332	1,954	1,197	511	664
TOTAL	**17,164**	**18,660**	**18,695**	**16,977**	**18,374**

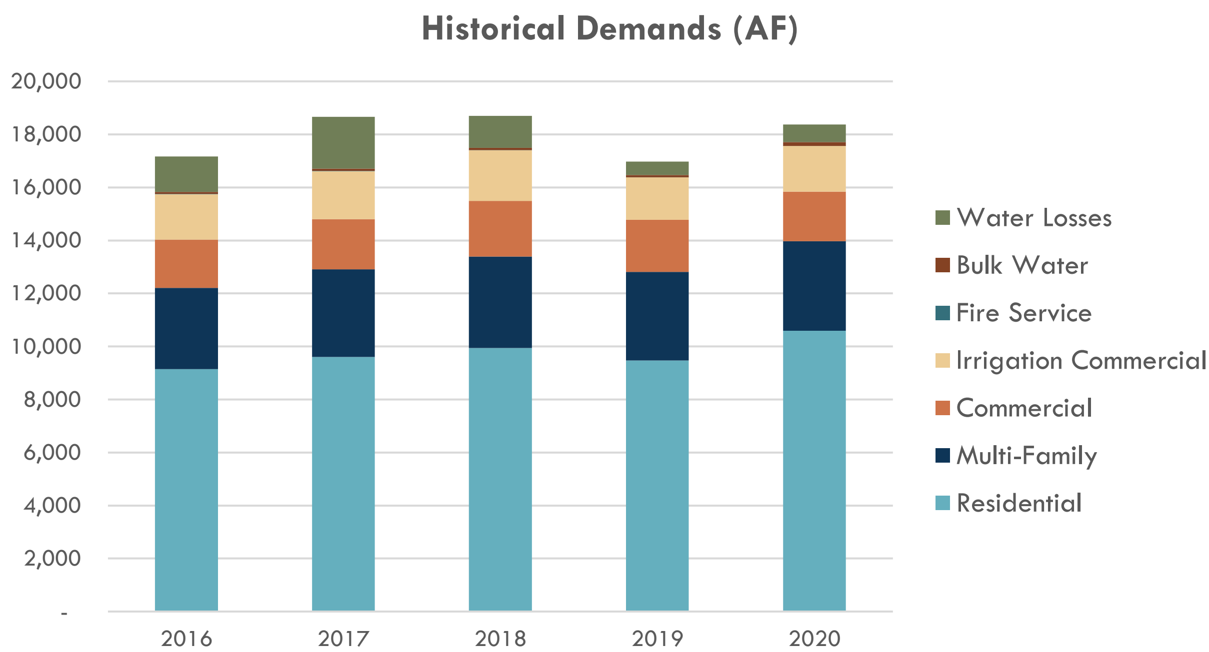


Figure 6-2: EVWD 2016-2020 Water Consumption by Customer Class (AF)

6.2.1.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water. Sources of water loss include:

- Leaks from water lines - Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall water loss. Aging pipes typically have more leaks.
- Unauthorized uses or theft of water – includes water used from fire hydrants without a meter or from an unauthorized, unmetered connection to EVWD's water system.

- Customer Meter Inaccuracies - Customer meters can under-represent actual consumption in the water system.

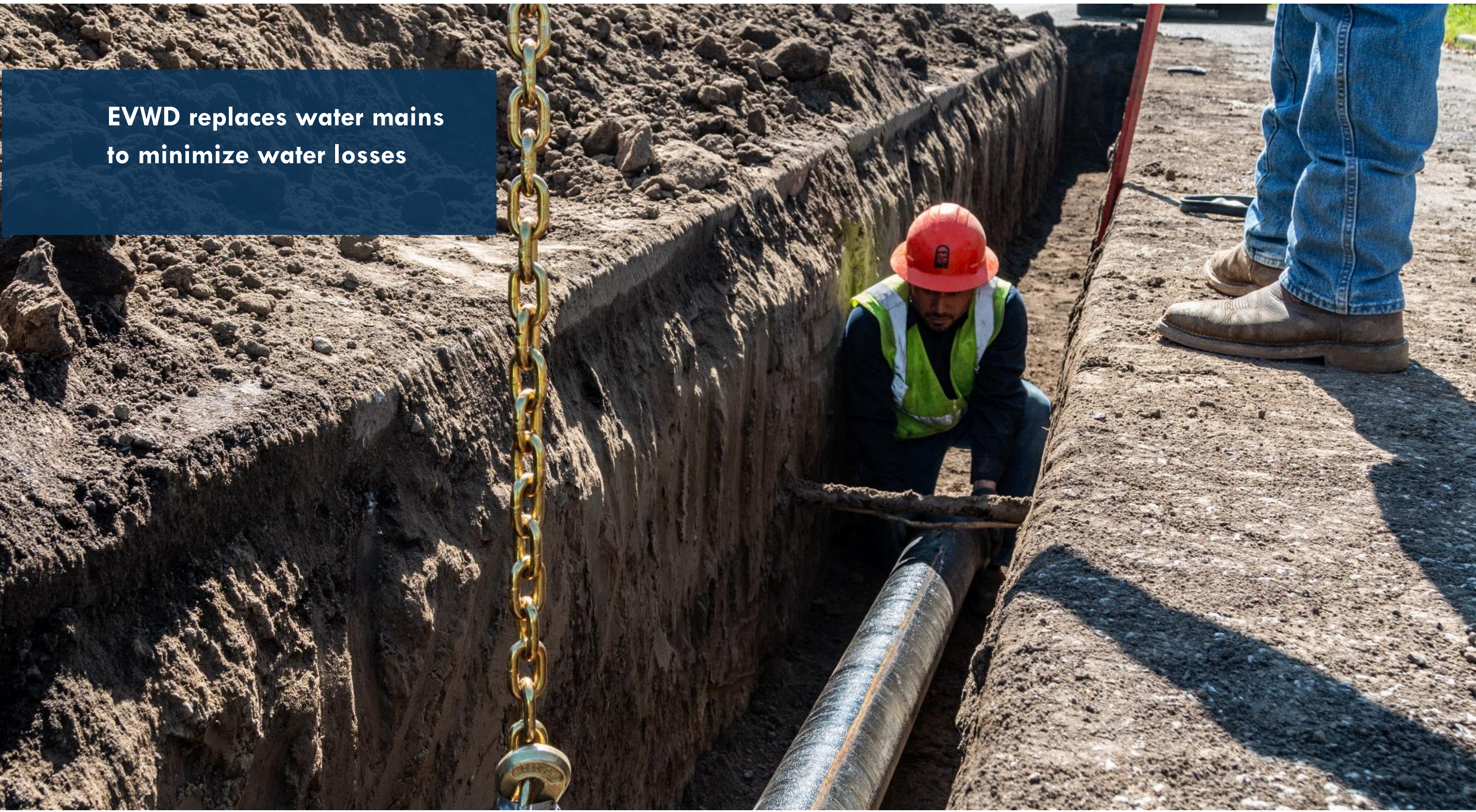
EVWD monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4 Appendix F-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 6-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020. EVWD will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 6-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS
1	2016	1,518
1	2017	1,854
1	2018	1,082
1	2019	503
1	2020	664 (Estimated)

In the past 5 years, EVWD's water loss decreased from 12% to 3% of water sales.

Over this time period, EVWD completed a meter replacement program in their service area. In addition, EVWD has an aggressive leak repair program and a water main replacement program. Improved metering accuracy and reduced leaks have helped reduce water loss from EVWD's distribution system.



The new meters are equipped with Advanced Metering Infrastructure (AMI) technology, which allows for a consistent stream of water-use history directly to the District's network. It can alert both the District and customers to excess water use caused from pipe breaks, toilet leaks, and broken valves. The meters internally audit a read every 15 minutes and each hour the read is sent to strategically placed collectors within the service area, with a 98% read rate every 3 days. With the detailed usage data available in an AMI system, customer service representatives have near real-time access to consumers' consumption information. EVWD customers also have access to a customer portal where they can view their own water use information. EVWD is developing additional customer education and outreach materials to help promote the use of this information to reduce water losses and increase water use efficiency.

Given the age of pipelines located within the District's service area, investing in replacement of this infrastructure in essential to reducing water losses. Prioritization of leak response is based on estimated water losses, including the number of staff and equipment assigned to the response. The District has an aggressive leak response program, which includes tracking water loss and leak locations. This information is then incorporated into the assessment and prioritization of pipeline replacement projects.

For the purposes of future demand projections in this Plan, EVWD assumed future water losses will be approximately 6% of total customer water use.

EVWD is committed to managing system water losses to reduce water waste and will strive to meet the future water loss performance standard that is being developed by the State Water Board.

6.2.2 Projected Water Use

A demand forecast tool was developed to estimate future demands based on individual customer categories and connections, with the ability to forecast how future changes in indoor and outdoor water use may impact overall water use within each different customer type for current and future customers. The tool has three steps to project demand:

1. Establish a demand factor per connection for each customer class based on historical consumption data.
2. Project the number of new connections anticipated for each customer class in each 5-year period after 2020.
3. Modify demand factors as appropriate to account for expected changes in future water use.

The demand factors for each customer class were based on connection and demand data from 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.

In the period from 2020 to 2025, the SCAG population growth rate projected that 709 new single family residential connections would be constructed. However, based on their development activity records, EVWD anticipates that 1,170 new single family residential connections could be constructed by 2025. To account for known developments, it was assumed that 1,170 new single family residential connections would be constructed by 2025 and 709 new single family residential connections would be constructed in each 5-year period thereafter. Connection growth for all other customer types was set equal to the SCAG population growth rate for the period 2020 through 2045.

To estimate future water use for each customer category, the demand factor is multiplied by the number of estimated new connections and added to the 2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the total future water use. Projected future demands by customer class as well as estimated losses are presented in **Table 6-5** and **Figure 6-3**.

Table 6-5: DWR 4-2R Projected Demands for Water (AF)

	PROJECTED WATER USE				
CUSTOMER CLASS	2025	2030	2035	2040	2045
Residential	11,211	11,589	11,966	12,316	12,667
Multi-Family	3,497	3,618	3,738	3,850	3,962
Commercial	1,939	2,006	2,073	2,135	2,197
Irrigation Commercial	1,787	1,848	1,910	1,967	2,024
Fire Service	3	3	3	4	4
Bulk Water	148	153	158	163	168
Water Losses	1,115	1,153	1,191	1,226	1,261
TOTAL	**19,702**	**20,371**	**21,040**	**21,661**	**22,283**

Table 6-6: DWR 4-3R Total Gross Water Use (AF)

	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	18,374	19,702	20,371	21,040	21,661	22,283
Recycled Water Demand From Table 6-4R	-	-	-	-	-	-
TOTAL WATER USE:	**18,374**	**19,702**	**20,371**	**21,040**	**21,661**	**22,283**

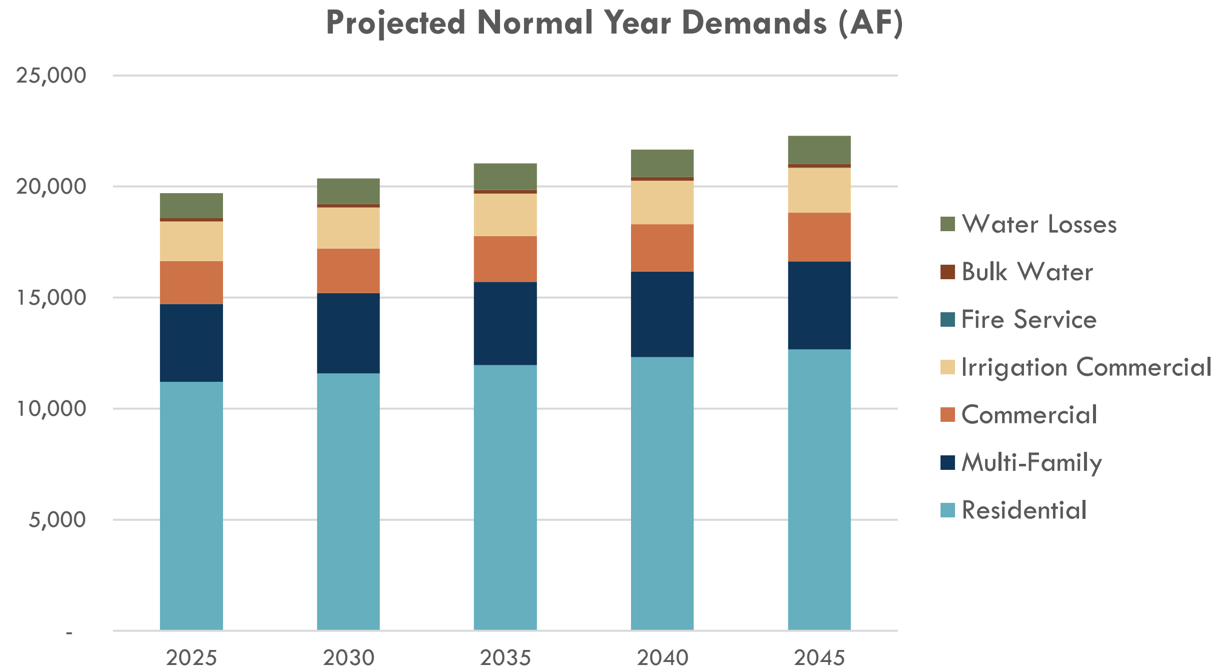


Figure 6-3: EVWD Projected Future Water Consumption by Customer Class (AF)

6.2.2.1 Estimating Future Water Savings

The demand tool used to project future water use has the capability to modify demand factors for both new and existing connections to quantify reductions in current and future customer demand that may occur as a result of active conservation programs implemented by EVWD or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. EVWD may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, EVWD has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of EVWD's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, EVWD will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. EVWD is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

6.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier.

EVWD serves portions of three jurisdictions, the City of Highland, the City of San Bernardino, and unincorporated County of San Bernardino.

Based on SCAG's 6th cycle final regional housing needs allocation, it is estimated an average of 40 percent of households in the service area are lower income. However, this methodology does not consider that portions of each jurisdiction that are within the EVWD service area may be lower income than the average within that jurisdiction, which may lead to under-projecting the percentage of lower income households. Although the District's analysis has consistently shown that approximately 50% of households are considered to be low income, the SCAG data was used for consistency in this document. These demands are included in the projections presented throughout this report.

6.2.4 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

EVWD has identified the need to consider the impacts of Climate Change in the 2020 update of the Emergency Response Plan and Hazard Mitigation Plan. These plans identify potential impacts and mitigation projects that can be implemented to reduce the impacts of this hazard.

6.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets EVWD developed and demonstrates that compliance by 2020 was achieved.

Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for EVWD's calculations are included in **Part 4 Appendix F-7**.

6.3.1 Baseline and Target

EVWD's baseline and 2020 target was calculated in the 2015 RUWMP and has not changed for this plan. More details on the development of the baselines and target can be found in the 2015 RUWMP and **Part 4 Appendix F-7**. EVWD's calculated water use target for 2020 is 172 GPCD.

6.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, EVWD has met its Confirmed Water use Target for 2020 of 172 GPCD, as shown in **Table 6-7**. To maintain this level of water use, EVWD intends to continue its current level of outreach and programs for the foreseeable future.

Table 6-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
172	165	Yes

6.4 Water Supply

EVWD's water supply consists primarily of groundwater from wells in the western portion of the service area. These wells, in the San Bernardino Basin (SBB), supply approximately 80% of the total water supply. In addition to groundwater, EVWD provides treated surface water from the Santa Ana River and the SWP by way of Plant 134, an 8-million gallon per day (MGD) water treatment plant. Plant 134 was originally constructed in 1996 and upgraded from 4 MGD to 8 MGD in 2013.

More information about local surface water and groundwater basins is included in **Part 1 Chapter 3** of the 2020 IRUWMP.

6.4.1 Purchased or Imported Water

Imported water available to EVWD is SWP purchased from Valley District. EVWD does not have a specific allocation of SWP water from Valley District but expects to receive the projected volumes of SWP water under most conditions. A description of this supply and its reliability is provided in **Part 1 Chapter 3 and Chapter 5**. This supply is not guaranteed so EVWD maintains 100% reliability from other sources.

EVWD currently supplements its local supply with SWP deliveries from Valley District for use at Plant 134. In the past, SWP has made up a small amount of EVWD's water supply. However, in 2018, a hydroelectric generation facility was installed on the SWP turnout that serves Plant 134. EVWD benefits from the energy generation and has shifted to prioritize the use of SWP water at Plant 134 to realize the energy cost savings.

6.4.2 Groundwater

EVWD produces groundwater from the San Bernardino Basin (SBB), described in detail in **Part 1 Chapter 3**. There are 22 wells within EVWD's water system, of which 15 wells are currently active and 7 are inactive. **Table 6-8** summarizes the actual volume of groundwater pumped from 2016-2020. Per the Western-San Bernardino Judgement, EVWD is not limited in the amount of groundwater they can produce from SBB. Relevant portions of the adjudications and judgments that govern groundwater use are provided in **Part 3 Appendix B**.

In 2018, EVWD and other local agencies voluntarily formed the SBB Groundwater Council to coordinate and implement groundwater management activities in the Bunker Hill Sub-basin (part of SBB) and achieve groundwater sustainability throughout the basin.

Table 6-8. DWR 6-1R Groundwater Volume Produced Last 5 Years (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	San Bernardino Basin (Bunker Hill)	12,792	15,217	14,525	12,940	15,169
-	**TOTAL**	**12,792**	**15,217**	**14,525**	**12,940**	**15,169**

6.4.3 Surface Water

As a shareholder of the North Fork Mutual Water Company (NFMWC), EVWD obtains water from the Santa Ana River. Created in 1885, the NFMWC and Bear Valley Land and Water Company (now Bear Valley Mutual Water Company) reached an agreement regarding water deliveries. Water deliveries vary throughout the year based on that agreement with deliveries in December through May equal to 1/4 flow of Santa Ana River, and in June through November equal to a fixed flowrate of water for the month that varies between 5.1 MGD and 7.7 MGD.

EVWD has current water rights of 5 MGD (5,600 AFY) of Santa Ana River water with the ability to expand to about 6.5 MGD (7,300 AFY) through the conversion of remaining agricultural properties and water shares of stock. EVWD is currently the majority shareholder in the company and continues to pursue the purchase of additional shares. As agricultural land converts to urban uses, EVWD gains not only the new urban demand but the associated historic water stock shares.

Surface water is treated in conjunction with any SWP water at EVWD's Plant 134. Surface water rights allocated to EVWD but not treated at Plant 134 are used to recharge the SBB. EVWD is also currently evaluating the concept of constructing a second surface water treatment plant on the east side of their service area.

6.4.4 Stormwater

EVWD is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the SBB. These regional projects are discussed in **Part 1 Chapter 3**.

6.4.5 Wastewater and Recycled Water

EVWD provides wastewater collection service to its customers. Wastewater treatment is currently provided by a regional treatment plant, located downstream and outside of EVWD's sphere of influence. A Joint Powers Agreement (JPA) was formed in 1957 between EVWD and the neighboring San Bernardino Municipal Water Department (SBMWD) whereby SBMWD treats all wastewater generated within the EVWD service area.

In 1995, SBMWD began operation of RIX to provide additional treatment of secondary effluent from the existing plants of SBMWD and the City of Colton. The RIX plant is located approximately 6 miles southwesterly and downstream of EVWD's southwesterly boundary.

EVWD is currently constructing a new water recycling facility called the Sterling Natural Resource Center (SNRC). SNRC, which is expected to be completed in 2022, will allow the District to treat wastewater to a point that it can be recharged into the Bunker Hill groundwater basin to supplement the groundwater supply. Initially, the facility will treat up to 8 MGD and will be expandable to treat ultimate buildout of approximately 10 MGD.

EVWD has partnered with Valley District to maximize the regional benefit of the recycled water produced at SNRC to recharge the SBB groundwater. Given the consistent need for groundwater replenishment compared to the potential uses for recycled water, there are currently no plans to use recycled water for any other purposes in the foreseeable future. For the purposes of this plan, projected recycled water supplies were estimated using the per capita wastewater flow projection methodology used in EVWD's 2019 Sewer Master Plan, adjusted to align with the population projection in this UWMP, which are inclusive of long-term growth plus expected near term developments.

It is estimated that approximately 6 MGD of the wastewater collected at the SBMWD treatment plant was generated within EVWD's water service area in 2020. Information about wastewater collected and treated is presented in **Table 6-9.**

Table 6-9. DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
East Valley Water District	Metered	6,815	City of San Bernardino	San Bernardino Water Reclamation Plant	No	No
	TOTAL	**6,815**				

6.4.6 Water Exchanges and Transfers

EVWD does not currently anticipate regular or long-term transfers or exchanges, during the period covered by this Plan. Any transfer or exchanges would be as-needed related to an emergency.

6.4.6.1 Emergency Interties

EVWD has emergency water supply connections to two adjacent water purveyors (SBMWD and the City of Riverside). These interties are intended to be used only as a short-term solution and are not accounted for as additional water supply.

6.4.7 Future Water Projects

EVWD is currently enhancing its ability to utilize its existing water supply sources through several projects that are in various phases of implementation, from planning to preliminary design to construction. Additionally, EVWD is evaluating further projects necessary to meet water demand at build-out conditions. These projects will be implemented as required by development in the service area. Future water projects at various stages of evaluation to maximize existing sources and to meet the demand at build-out include:

- Additional groundwater wells
- New 6 MGD surface water treatment plant in the eastern service area
- Regional conjunctive use projects with Valley District

These projects do not increase water supplies available to EVWD, but rather allow EVWD to increase utilization and optimization of existing supplies and to make deliveries to the different portions of the service area.

Furthermore, as discussed in **Section 6.4.3**, EVWD is actively seeking to purchase additional outstanding shares of the NFMWC.

6.4.8 Summary of Existing and Planned Sources of Water

EVWD's water supply is comprised of local groundwater, local surface water and SWP water. EVWD is also developing a new recycled water supply that will be used to replenish the groundwater basin. These same supplies will be used in the future but may shift toward more surface water if EVWD constructs another surface water treatment plant.

As discussed in **Part 1 Chapter 5**, EVWD is applying a Reliability Factor of 15% to their supply reliability analysis to account for uncertainties in supply and demand projections. The 15% value is recommended in a study by the RAND Corporation that evaluated uncertainty factors in the regional supplies and demands, including population growth, per capita water use, climate change impacts on supplies and demands, SWP project supplies and local surface water supplies. See **Part 1 Chapter 5** for more details on how the Reliability Factor was established.

For the purposes of supply projections in this 2020 IRUWMP, EVWD is using the 15% Reliability Factor to establish a supply target of 15% more than total projected demand. While utilizing as much local surface water and SWP supplies as feasible, EVWD will source all other supplies from the San Bernardino Basin.

As discussed in **Part 1 Chapter 3**, the San Bernardino Basin is a shared resource, and the Western-San Bernardino Judgement does not limit pumping by agencies within the Valley District service area. Each agency can pump as much water as they need and if total pumping by all agencies exceeds the safe yield, Valley District is responsible for replenishing the SBB. As shown in **Part 1 Chapter 5**, the total planned use of San Bernardino Basin groundwater by all agencies in Valley District's service area, including the Reliability Factor, is below the safe yield of the SBB through 2045 so supplemental recharge is not anticipated to be required and is not included in EVWD's supply projection. However, the SBB Groundwater Council, which EVWD is a member of, may elect to recharge the SBB with supplemental water to provide additional supply reliability.

Table 6-10 summarizes the water resources used by EVWD in 2020, and the projected future supplies are summarized in **Table 6-11**.

Table 6-10. DWR 6-8R Actual Water Supplies in 2020 (AF)

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2020 ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	San Bernardino Basin (Bunker Hill)	15,169	Drinking Water	
Surface water (not desalinated)	Santa Ana River (part of SBB)	997	Drinking Water	~5,600
Purchased or Imported Water	SWP - Direct Deliveries	2,208	Drinking Water	
	TOTAL	**18,374**		

Table 6-11. DWR 6-9R Projected Water Supplies (AF)

		PROJECTED WATER SUPPLY				
		2025	2030	2035	2040	2045
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	San Bernardino Basin (Bunker Hill)	10,257	10,736	11,205	11,620	12,035
Surface water (not desalinated)	Santa Ana River (part of SBB)	1,700	1,700	1,700	1,700	1,700
Purchased or Imported Water	SWP - Direct Deliveries	2,500	2,500	2,500	2,500	2,500
Recycled Water	San Bernardino Basin - Recycled Water Recharge	8,200	8,490	8,790	9,090	9,390
	TOTAL	**22,657**	**23,426**	**24,195**	**24,910**	**25,625**

Recycled water recharge supplies shown indicate water that will be extracted from SBB and replaced in-kind with recycled water recharge. Surface and imported water supplies indicate planned diversions and deliveries. Supplies from San Bernardino Basin are increased to meet the Total Supply Target with 15% Reliability Factor.

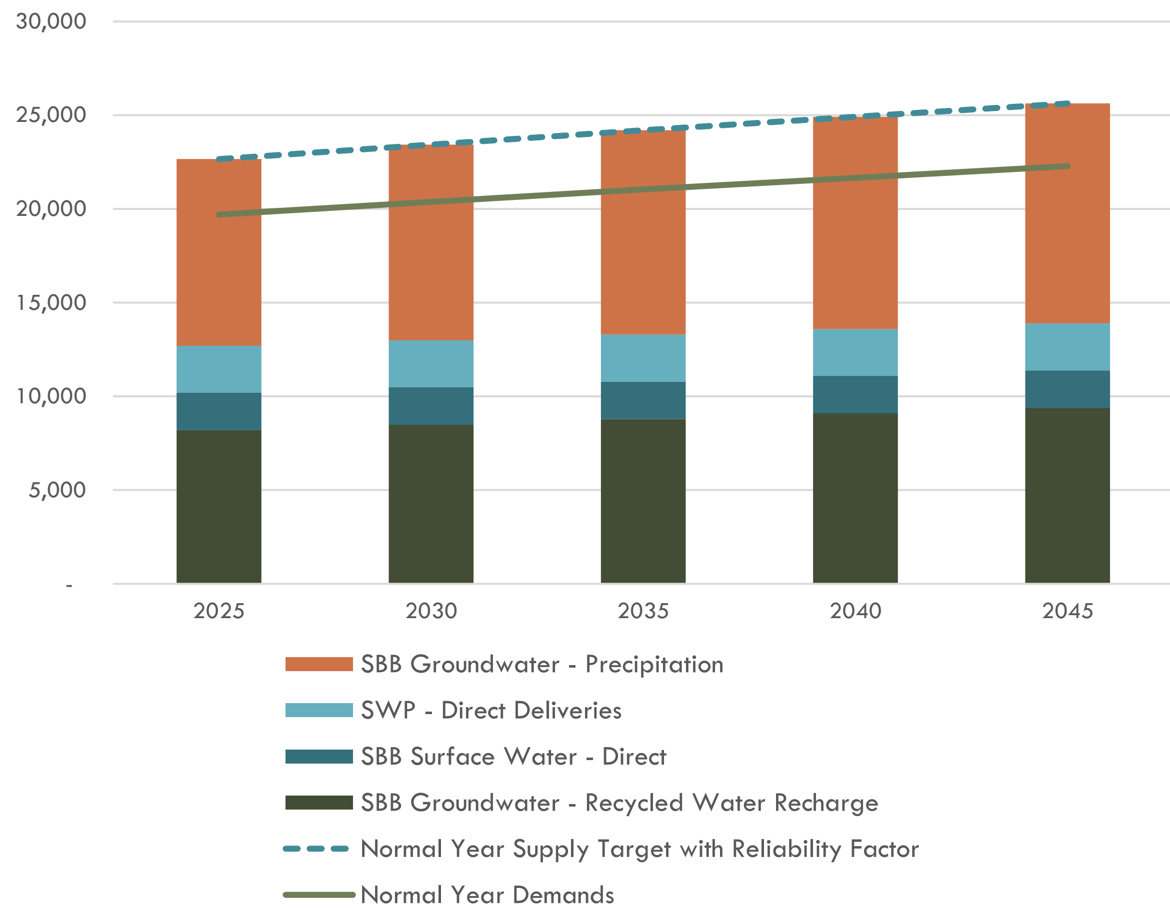


Figure 6-4: EVWD Projected Supply and Demand Comparison (AF)

Table 6-12. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	22,657	23,426	24,195	24,910	25,625
Demand Totals From Table 4-3R	19,702	20,371	21,040	21,661	22,283
DIFFERENCE	**2,955**	**3,056**	**3,156**	**3,249**	**3,342**

6.4.9 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2012 EVWD completed an Energy Optimization Study which identified the 15 largest energy using facilities in the EVWD water system and determined that the total average monthly energy use was 1,373,705 kilowatt-hours (kWh). EVWD also has a 10-year performance contract with Honeywell International Inc. to assess the performance of energy cost reduction measures (ECMs) at EVWD's facilities. It was estimated that EVWD would save 1,055,940 kWh/yr due to these ECMs.

In 2016, EVWD consumed a total of 15,059,699 kWh of energy for water facilities, for an energy intensity of 870 kWh per AF of water delivered.


SNRC under construction

6.5 Water Service Reliability Assessment

This section considers EVWD's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from EVWD's current source of supply through 2045.

6.5.1 Constraints on Water Sources

During times of State-wide drought conditions, the availability of SWP may be reduced. These conditions are normally known in advance, providing EVWD with the opportunity to plan for the reduced supply. During a drought period, it is Valley District's priority to make direct deliveries to the water treatment plants operated by Redlands, WVWD, YVWD, and EVWD. Because EVWD's water treatment plant can use local surface water and imported water, during a single-dry year EVWD may elect to take a small amount of imported water, making more imported water available to other agencies. In this case, EVWD would utilize additional groundwater through groundwater well production from the SBB. In a multiple dry year Valley District expects to fulfill normal direct deliveries to water treatment plants, including EVWD's treatment plant.

Some of EVWD's wells are impacted by nitrate, perchlorate, fluoride, uranium, and/or VOCs. EVWD has suspended operation at Well 12A. EVWD has plans in place that will allow these wells to come back on-line. EVWD continues to monitor for groundwater contamination and the movement of groundwater contaminant plumes. In response to water quality concerns EVWD has altered operations at other wells to compensate for the reduced capacity and the following actions have been put into place to protect EVWD supply:

- A wellhead treatment facility has been implemented to treat VOCs from Well 28A using granulated activated carbon.
- EVWD blends water from Well 39 to address high fluoride levels.
- EVWD continues to monitor for nitrates in Wells 25A and 28A.

These past and ongoing groundwater treatment projects have demonstrated that treatment is an economically viable alternative for handling volatile organic compounds, perchlorate, nitrates, and uranium. To manage the long-term potential for continued groundwater contamination, EVWD has an on-going land acquisition program. EVWD has vacant land available for future facilities. Sites are selected for the development of new wells based on knowledge of the plumes' movement, land availability and engineering feasibility. Based on current conditions water quality is not anticipated to affect EVWD supply reliability. However, water quality issues are constantly evolving. EVWD will take action to protect and treat supplies when needed, but it is recognized that water treatment can have significant costs.

As described in **Part 1 Chapter 3**, the SBB is adjudicated on a safe yield basis. EVWD therefore can develop additional wells and over-extract groundwater under specified conditions contained in the stipulated judgment and participates in the SBB GC to contribute to maintaining basin sustainability. The wells in general have provided a stable source of water supply. Past records show that EVWD has not removed any well from its supply source during drought conditions, although, some wells had to be lowered to continue extraction of groundwater. In recent droughts, EVWD has maintained full capability to use all wells within its system. As described in **Part 1 Chapter 3**, extensive modeling has been used to examine groundwater recharge, groundwater pumping, basin storage, groundwater flow, and groundwater plume location and plume migration.

6.5.2 Year Type Characterization

In general, groundwater and recycled water are 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 BTAC, monitors groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in Part 1, Chapter 3.

Per UWMP requirements, EVWD has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition 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.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

6.5.3 Water Service Reliability

The results of the reliability assessment are summarized in the tables below.

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. 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% increase throughout the 5-year drought to be conservative.

As described in **Part 1 Chapter 3 and Chapter 5**, the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. While SWP water and local surface water supplies may be reduced in dry years, EVWD is able to pump additional groundwater from Bunker Hill to meet total demands in dry years and participates in the SBB GC to replenish the basins with imported and local water through regional recharge programs. Since EVWD's total supplies are not reduced in dry years, 2020 is considered the base year for all year types. Based on the analysis, EVWD does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, EVWD participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. EVWD also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 6-13**. The percent of average supply increases in drought years because EVWD's groundwater production will increase to meet an assumed increase in demands.

Table 6-13. DWR 7-1R Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS AS PERCENT OF AVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a normal year are shown in **Table 6-12**.

The projected supply and demand during a single dry year are shown in **Table 6-14**. EVWD's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basin EVWD produces water from has storage for use in dry years, so EVWD can produce the volume of water needed to meet 100% of demands in single dry years. EVWD supplies are 100% reliable during single dry years.

Table 6-14. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals	24,923	25,769	26,615	27,401	28,188
Demand Totals	21,672	22,408	23,143	23,827	24,511
DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**

The projected supply and demand during five consecutive dry years are shown in **Table 6-15**. EVWD's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basin EVWD produces water from has storage for use in dry years, so EVWD can produce the volume of water needed to meet 100% of demands in multiple dry years. EVWD's supplies are 100% reliable during multiple dry years.

Table 6-15. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
FIRST	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**
SECOND	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**
THIRD	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**
FOURTH	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**
FIFTH	Supply Totals	24,923	25,769	26,615	27,401	28,188
YEAR	Demand Totals	21,672	22,408	23,143	23,827	24,511
	DIFFERENCE	**3,251**	**3,361**	**3,472**	**3,574**	**3,677**

6.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because EVWD relies on a groundwater basin with significant storage, total available supplies do not vary on a monthly or seasonal basis, so this analysis is conducted on an annual basis. Projected demands and supplies from 2021-2025 are shown in **Table 6-16**.

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. The DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in **Section 6.5** and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for EVWD. EVWD can produce additional groundwater to meet any increases in demand in dry years. As shown in **Part 1 Chapter 5**, the region as a whole has sufficient supplies to meet demands plus the 15% Reliability Factor, even in a 5-year drought. As shown in **Part 1 Chapter 5 Figure 5-1**, the SBB had over 4.8 million acre-feet in storage as of 2020 due to regional efforts to store water in wet years for use during dry years.

Although projections in this Plan show that the regional water supplies are sufficient to meet the demands of EVWD and the Region as a whole, even during a 5-year drought (see **Part 1**

Chapter 5), EVWD remains committed to water conservation and to being a good steward of regional water resources to preserve supplies for the future due to the possibility of experiencing more severe droughts than anticipated in this Plan.

Table 6-16: Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	20,503
	Total Supplies	23,579
	SURPLUS	**3,076**
2022	Gross Water Use	20,796
	Total Supplies	23,915
	SURPLUS	**3,119**
2023	Gross Water Use	21,088
	Total Supplies	24,251
	SURPLUS	**3,163**
2024	Gross Water Use	21,380
	Total Supplies	24,587
	SURPLUS	**3,207**
2025	Gross Water Use	21,672
	Total Supplies	24,923
	SURPLUS	**3,251**

6.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that EVWD 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 a number of reasons, such as water supply 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 EVWD 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 EVWD maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. EVWD's WSCP is attached as **Part 4 Appendix F-9**.

6.8 Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that EVWD has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. EVWD's current per-capita consumption is less than its 2020 compliance target. EVWD expects to continue to implement conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

6.8.1 Existing Demand Management Measures

Consistent with the requirements of the California Water Code, this section describes the required demand measurement measures (DMM) that have been implemented in the past five years and will continue to be implemented into the future. Through the implementation of its active water conservation programs, EVWD has met its Confirmed Water use Target for 2020. To maintain efficient water use, EVWD intends to continue its current demand management measures for the foreseeable future to consider future water use requirements that may be implemented.

6.8.1.1 Water Waste Prevention Ordinances

As detailed in Section 15 of Ordinance 401 EVWD restricts water waste through its Water Conservation Ordinance. Section 15 of Ordinance 401, adopted on May 12, 2021, prohibits excessive irrigation runoff from a meter service area, irrigation after measurable rainfall, hosing of hard surfaces, and using potable water to irrigate turf and high water use plant materials in medians and bordering parkways during times of threatened supply conditions and water emergency supply conditions (Ordinance 401 is included in **Part 4 Appendix F-9**).

6.8.1.2 Metering

All of EVWD's customer connections are metered. EVWD has a meter maintenance and replacement plan and recently completed implementation of AMI technology for all meters, which enables two-way communication between EVWD's customer billing system and the customer meters for over 20,000 connections. This allows for near real-time notifications of potential inefficient water use concerns. With the detailed usage data available in an AMI system, customer service representatives have immediate access to consumers' consumption information. EVWD customers also have access to a customer portal where they can view their own water use information in near real-time.

6.8.1.3 Conservation Pricing

Conservation pricing is designed to discourage wasteful water habits and encourage conservation. EVWD charges its Residential customers using a budget-based structure which consists of three separate pricing tiers for potable water. The first tier is a customized estimate of indoor water use for each household based on average household sizes identified by the 2010 U.S. Census. The second tier is an estimate of efficient outdoor irrigation. Tiers one and two are considered in-budget water use and tier three represents inefficient water usage. EVWD allows for specific variances which may require higher allocations of water for circumstances such as medical need, in-home childcare, and livestock.

EVWD charges its Commercial customers differently in that their water budget is based on the customer's historic use for the same billing periods of the prior two years. EVWD calculates an average year demand for a billing period based on the same billing period of the past two years. Commercial customers' water budget may be adjusted by EVWD. Usage in excess of the water budget is billed at inefficient use Tier 3 pricing.

Landscaping measurements were developed using lidar technology personalized for each parcel. Given that the District is located in the foothills of the San Bernardino Mountains, EVWD ensured accuracy of irrigated slopes. Additionally, irrigation accounts are not allocated water use within Tier 1.

Metering with commodity rates, in particular budget-based rates, is an effective conservation measure that directly associates cost with the amount of water used.

6.8.1.4 Public Education and Outreach

EVWD consistently works to educate the public and increase awareness of the District's projects and programs in the local and regional community. Effective communication is provided through a number of methods including: bill inserts; informative flyers; direct mail pieces; newspaper advertisements; bus shelter advertisements; news releases; social media outreach; and website content. District staff participate in career day and school events, offer tours of District facilities and support community events with information booths. Yard signs, fact sheets, rebate programs, monthly conservation tips, vehicle magnets, banners, educational workshops, and regular staff communication are also part of the District's comprehensive outreach program.

EVWD continues to prioritize community education over strict enforcement. Through the development of positive relationships with community-based organizations and residents alike, the District can serve as a trusted resource in wet and dry years. Outreach efforts are used to establish a connection with customers, increase District visibility, promote a transparent operation, and foster an environment of enhanced public service. EVWD also provides school visits and presentations when requested by the school.

6.8.1.5 Programs to Assess and Manage Distribution System Real Losses

EVWD has an active water loss control program and is in the process of conducting a water audit for FY2020-2021. EVWD uses Cityworks work order program to track leaks, flushing, and other non-revenue water sources. Through Cityworks and staying proactive in reviewing water mains throughout the service area, EVWD identifies problem areas in the distribution system that need to be repaired or upgraded. EVWD uses preventative maintenance to ensure safe delivery of water to all of its customers.

6.8.1.6 Water Conservation Program Coordination and Staffing Support

EVWD has a full-time conservation coordinator, conservation/public affairs manager, and a member of the executive team, in addition to shared time for outreach staff, and empowers all District staff to take an active role in the drought response. The program's budget is funded through budget-based rates. During times of drought where additional resources are needed to minimize inefficient water use, all District staff are actively engaged in notifying customers of observed violations of the Conservation Ordinance. Though not required in wet years, the District has historically utilized part-time personnel to address the increased enforcement requirements during times of drought.

6.8.1.7 Other Demand Management Measures

To encourage the efficient use of water in the residential sector, EVWD currently offers rebates as shown in **Table 6-17**.

Table 6-17. Residential Rebate Program Summary

TITLE	DESCRIPTION
High-Efficiency Washing Machine	Up to $150, for the purchase of a clothes washer with a water factor of 5 or less and is recognized as an EnergyStar appliance.
High-Efficiency Showerhead	Up to $30, per showerhead that uses 2 gallons or less per minute and is recognized by the WaterSense program.
High-Efficiency Toilets	Up to $100, per toilet installed that uses 1.28 gallons or less per flush and is recognized by the WaterSense program.
Direct Installation Program- Weather Based Irrigation Controllers	Weather based irrigation controllers (WBIC) use the weather to set your irrigation schedule instead of a traditional sprinkler controller. To help customers be water efficient outdoors, the District will replace your old irrigation controller with a new WBIC through a new direct installation program at no cost to the customer.
Weather-Based Irrigation Controller	Up to $150, per weather-based irrigation controller installed that automatically adjust irrigation schedules for sprinkler systems in response to changing weather or environmental conditions
High-Efficiency Sprinkler Nozzles	Up to $4, per High-Efficiency Sprinkler nozzle installed that uses less water per minute than conventional nozzles.
Water Efficient Landscaping	Up to $200, for water efficient landscaping that uses native plants, efficient irrigation systems and other landscaping elements that thrive using less water than traditional grass lawns.

EVWD currently offers multiple residential rebate programs to help customers achieve water use efficiency. For more information about this DMM, visit: **https://www.eastvalley.org/275/Rebate**.

6.9 Adoption, Submittal and Implementation

This section describes EVWD's process for adopting, submitting, and implementing the 2020 IRUWMP and EVWD's WSCP.

6.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to EVWD's public hearing. The recipients are identified in Part 1 Chapter 1 and include all cities and counties within EVWD's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

EVWD provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4 Appendix F-2**.

6.9.2 Public Hearing and Adoption

EVWD held a public hearing on June 23, 2021, to hear public comment and consider adopting this 2020 IRUWMP and EVWD's WSCP.

As part of the public hearing, the EVWD provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed EVWD the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

EVWD's adoption resolution for the 2020 IRUWMP and EVWD's WSCP is included in **Part 4 Appendix F-3**.

6.9.3 Plan Submittal

EVWD will submit the 2020 IRUWMP and EVWD's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. 2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

6.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, EVWD will make the plan available for public review during normal business hours by placing a copy of the 2020 IRUWMP and EVWD's WSCP at the front desk of the District's office, and by posting the plans on the District's website for public viewing.

6.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or EVWD’s WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

RIVERSIDE HIGHLAND WATER COMPANY

2020 IRUWMP

Part 2 Chapter 7

RHWC 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

WSC

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

7

RETAIL URBAN WATER MANAGEMENT PLAN

Riverside Highland Water Company

This chapter describes information specific to the Riverside Highland Water Company, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the Riverside Highland Water Company's reporting requirements for 2020 under the UWMP Act.

7.1 System Description

Riverside Highland Water Company (RHWC) is a Mutual Water Company, shareholder owned and regulated by the California Corporation Commission and governed by a nine-member Board of Directors. Currently serving the City of Grand Terrace, the Highgrove area of Riverside County and small portions of San Bernardino County and the City of Colton, RHWC provides domestic and irrigation water services. The water service is provided to single and multi-family residential, commercial, industrial and agricultural users. RHWC is a retail public water supplier that meets the definition of an urban water supplier with over 5,300 municipal water service connections in 2020.

Historically, a large portion of the water service has been irrigation water for citrus groves, but rapid urbanization has resulted in a large portion of the citrus groves being removed for land development projects for housing, commercial and industrial use. As a result, irrigation water demand is decreasing and domestic water demand is increasing. Large parks and greenbelt areas are served with irrigation water from non-potable wells with nitrate concentrations in excess of drinking water standards.

IN THIS SECTION

The service area is largely developed with the major population center in the service area located in the City of Grand Terrace. The service area is shown in **Figure 7-1.**

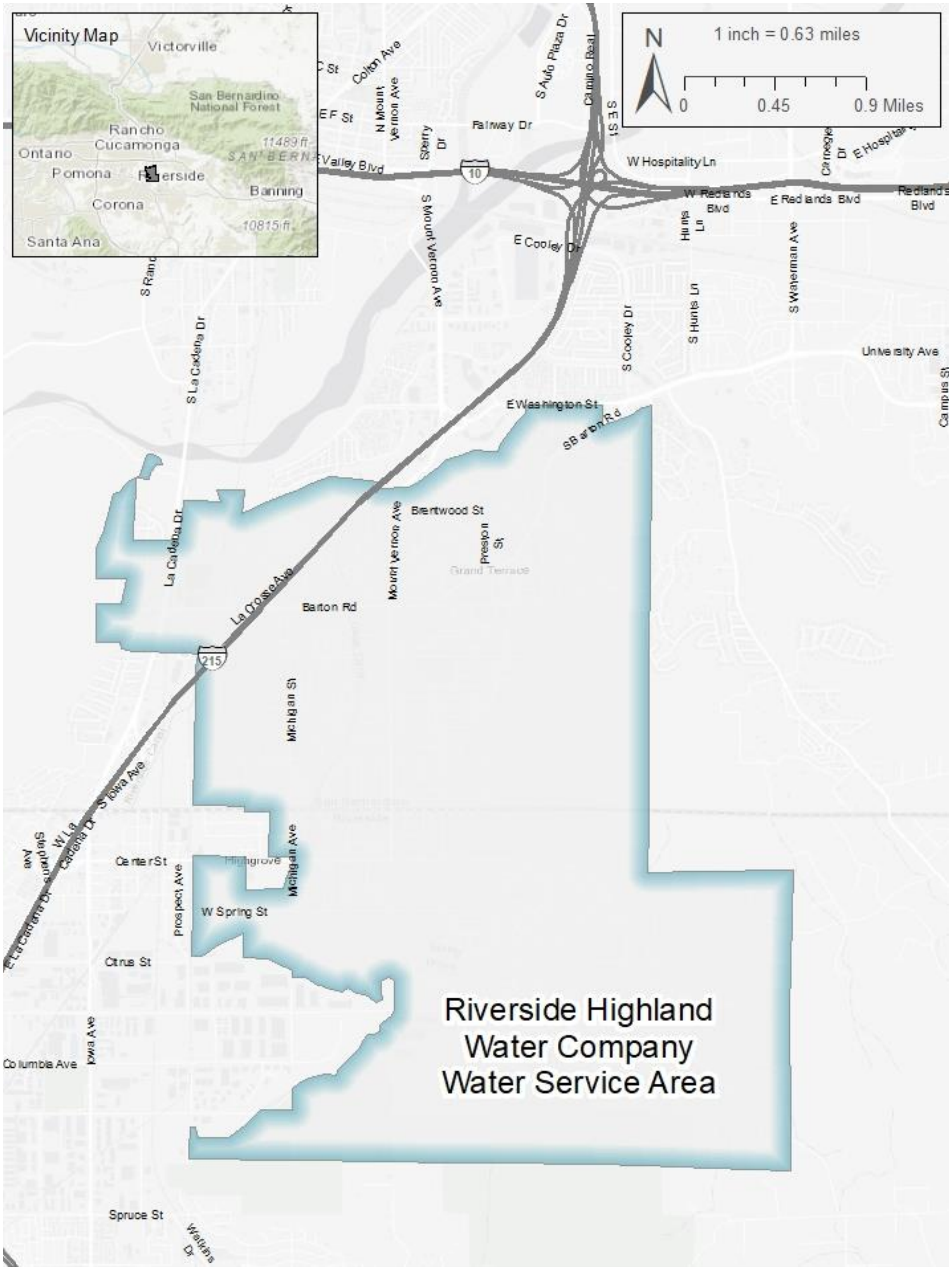


Figure 7-1: Riverside Highland Water Company Service Area Map

7.1.1 Population

For the purposes of consistent reporting of population estimates, the California Department of Water Resources (DWR) has developed a GIS-based tool (DWR Tool) to estimate the population within a water agency's service area using census data and number of water service connections. The DWR Tool was used to intersect the service area boundary with census data to provide population estimates for 1990, 2000, and 2010. The DWR Tool uses the number of service connections in those prior census years, where available, to calculate a persons-per-connection factor, which is then projected forward to estimate population in a given year using the number of connections in that year.

To estimate population for future years, projections from SCAG were used. SCAG has developed a forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and in 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. The service area boundary was intersected with a GIS shapefile of the SCAG TAZs to provide an estimate of population within the service area for years 2020, 2035, and 2045. These estimates were used to calculate compound annual population growth rates for years 2020-2035 and 2035-2045. The population growth rates were applied to the 2020 population to estimate future population. Estimated 2020 and future year population is shown in **Table 7-1.** The 2025 population was adjusted upwards to account for known developments planned for construction by 2025, and all subsequent population projections were based on the 2025 population projection.

Per SCAG requirements, it must be noted that this population modeling analysis was performed by Water Systems Consulting, Inc. based upon modeling information originally developed by SCAG. SCAG is not responsible for how the model is applied or for any changes to the model scripts, model parameters, or model input data. The resulting modeling data does not necessarily reflect the official views or policies of SCAG. SCAG shall not be held responsible for the modeling results and the content of the documentation.

SCAG prepares demographic forecasts based on land use data for their region through extensive processes that emphasizes input from local planners and is done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Table 7-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**20,755**	**23,225**	**24,199**	**25,213**	**25,755**	**26,309**

7.1.2 Land Use

The City of Grand Terrace makes up the majority of the RHWC service area. For purposes of this report, it is assumed that the distribution of land use within the City of Grand Terrace is representative of land uses within the RHWC service area. Per the City of Grand Terrace 2010

General Plan, land use within the City of Grand Terrace is 54% residential, 9% commercial, 10% industrial, 3% public, 8% open space, and 16% street and railroad rights of way.

7.2 Water Use

This section describes the current and projected water uses within RHWC's service area. RHWC serves potable water to municipal and industrial customers and serves non-potable water to agricultural irrigation customers.

7.2.1 Water Use by Sector

RHWC categorizes its water customers into seven categories for the purposes of billing: Single Family Residential, Multi-Family Residential, Commercial & Institutional, Industrial, Landscape, Agricultural Irrigation, and Other. Water uses classified as Other do not have permanent service connections, and include uses such as fire suppression, bulk water purchases, and construction water. Landscape and Agricultural Irrigation connections include both potable and non-potable connections. The number of active connections in each category from 2016 to 2020 are shown in **Table 7-2**.

Table 7-2: RHWC 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Single Family Residential	4,074	4,265	4,603	4,856	5,070
Multi-Family Residential	81	71	71	71	71
Commercial & Institutional	86	81	79	79	78
Industrial	4	4	4	4	4
Landscape	97	88	92	105	110
Agricultural Irrigation	3	3	3	2	2
TOTAL	**4,345**	**4,512**	**4,852**	**5,117**	**5,335**

7.2.1.1 Past Water Use

RHWC's actual water use by customer class from 2016-2020 is shown in **Table 7-3** and water consumption by customer class in the last five years is shown in **Figure 7-2.** Approximately 74% of RHWC's total deliveries were to single family residential connections, followed by 14% to landscape connections, 6% to multi-family residential connections, and the remainder to commercial & institutional, industrial, agricultural irrigation, and other customers. Landscape and Agricultural Irrigation water use includes both potable and non-potable use.

Table 7-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	2,165	2,393	2,663	2,517	2,959
Multi-Family Residential	262	223	228	252	226
Commercial & Institutional	143	174	181	147	151
Industrial	9	55	64	10	6
Landscape	378	445	524	477	552
Agricultural Irrigation	90	78	91	66	77
Other	33	57	55	92	34
Water Losses	57	193	60	193	241
TOTAL	**3,137**	**3,617**	**3,865**	**3,753**	**4,246**

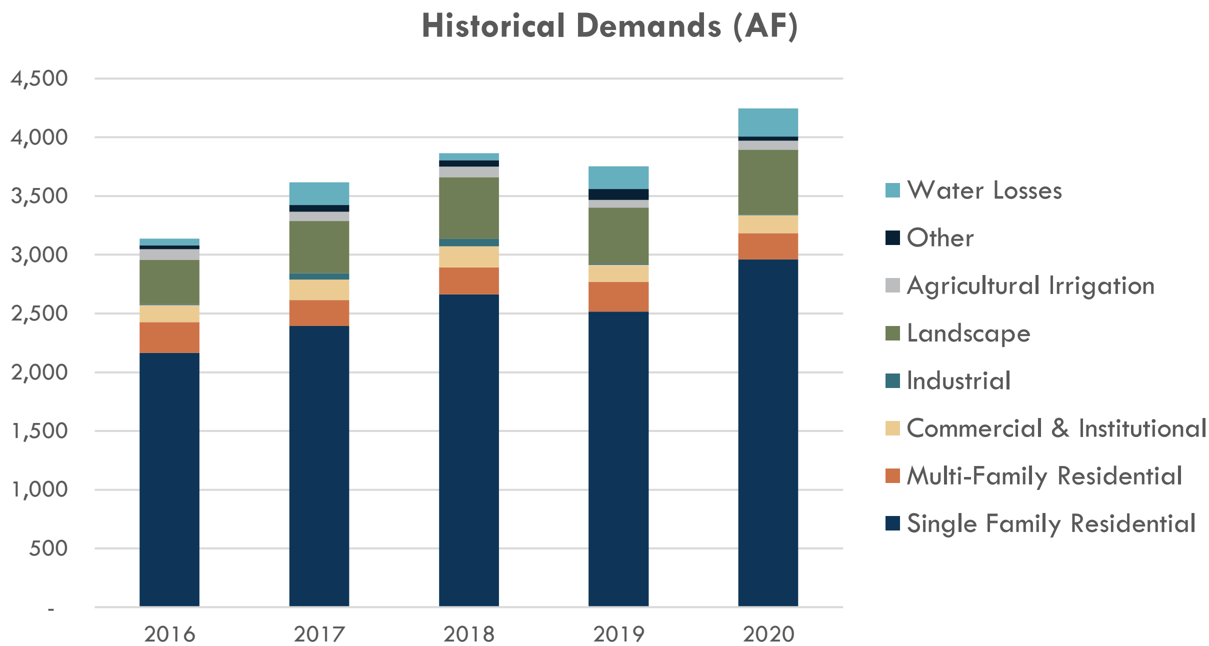


Figure 7-2: RHWC 2016-2020 Water Consumption by Customer Class (AF)

7.2.1.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water.   Sources of water loss include:

- **Leaks from water lines.** Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall water loss. Aging pipes typically have more leaks.
- **Unauthorized uses or theft of water.**

- **Customer Meter Inaccuracies.** Customer meters can under-represent actual consumption in the water system.

RHWC monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4 Appendix G-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 7-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020.

RHWC will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 7-4: DWR 4-4R 12 Month Water Loss Audit Reporting

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS*
1	2016	130
1	2017	106
1	2018	77
1	2019	185
1	2020	241 (Estimated)

The 2020 AWWA Water Audit is not yet available. The 2020 water losses are estimated based on the difference between production and consumption in 2020.

In the past 5 years, RHWC's water loss has ranged from 2% - 6% of water sales. For the purposes of future water use projections, water loss is assumed to be 6% of projected water sales.

RHWC is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standard that is being developed by the State Water Board. A discussion of current and planned water loss management measures is included in **Section 7.8.1.5.**

7.2.2 Projected Water Use

A demand forecast tool was developed to estimate future demands based on individual customer categories and connections, with the ability to forecast how future changes in indoor and outdoor water use may impact overall water use within each different customer type for current and future customers.

The tool has three steps to project demand:

1. Establish a demand factor per connection for each customer class based on historical consumption data.
2. Project the number of new connections anticipated for each customer class in each 5-year period after 2020.
3. Modify demand factors as appropriate to account for expected changes in future water use.

The demand factors for each customer class were based on average connection and demand data from calendar years 2016-2020, 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.

In the period 2020-2025, the SCAG population growth rate projected that 213 new single family residential connections would be constructed, however, RHWC is currently experiencing rapid residential growth and anticipates an additional 500 single family residential connections in addition to the SCAG projection being constructed by 2025. The number of new single family connections in 2025 was adjusted upward to reflect known developments. Furthermore, the SCAG population growth rate anticipated five new dedicated landscape connections to be constructed in each 5-year period following 2020, however based on RHWC's understanding of projected future growth in the service area, nine new dedicated landscape connections are anticipated in each 5-year period after 2020.

To estimate future water use for each customer category, the demand factor is multiplied by the number of estimated new connections and added to the average 2016-2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the total future water use. Projected future demands by customer class as well as estimated losses are presented in **Table 7-5**, **Table 7-6**, and **Figure 7-3**.

Table 7-5: DWR 4-2R Projected Demands for Water (AF)

	PROJECTED WATER USE				
ADDITIONAL DESCRIPTION	2025	2030	2035	2040	2045
Single Family Residential	3,211	3,329	3,447	3,507	3,568
Multi-Family Residential	241	251	261	266	271
Commercial & Institutional	160	167	173	176	180
Industrial	30	31	32	33	34
Landscape	576	620	665	688	710
Agricultural Irrigation	65	67	70	71	72
Other	5	5	5	6	6
Nonrevenue	257	268	279	285	290
Total:	**4,545**	**4,738**	**4,932**	**5,031**	**5,131**

Table 7-6: DWR 4-3R Total Gross Water Use (AF)

-	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	4,246	4,545	4,738	4,932	5,031	5,131
Recycled Water Demand* From Table 6-4R	-	-	-	-	-	-
TOTAL WATER USE:	**4,246**	**4,545**	**4,738**	**4,932**	**5,031**	**5,131**

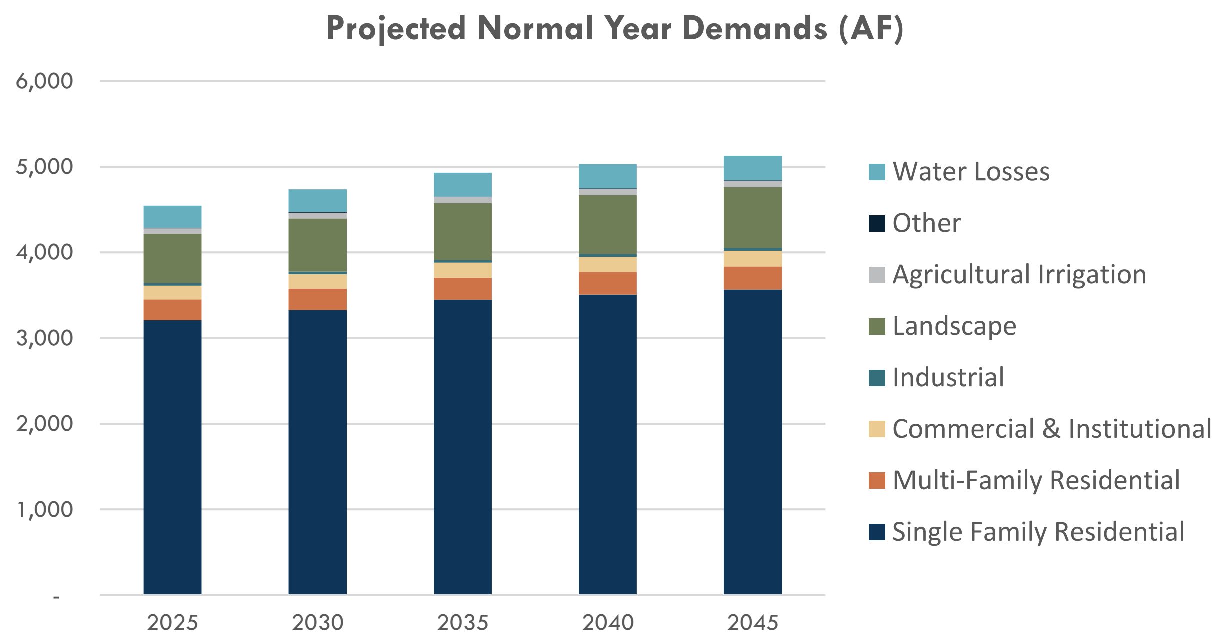


Figure 7-3: RHWC Projected Future Water Consumption by Customer Class (AF)

7.2.2.1 Estimating Future Water Savings

The demand tool used to project future water use has the capability to modify demand factors for both new and existing connections to quantify reductions in current and future customer demand that may occur as a result of active conservation programs implemented by RHWC or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. RHWC may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, RHWC has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of RHWC's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, RHWC will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. The RHWC is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

7.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires water use projections in an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. The major population center in the RWHC service area is the City of Grand Terrace.

RHWC's accounting system does not track the number of low-income households; therefore, projections were estimated based on SCAG's 6th cycle final regional housing needs allocation (RHNA), it is estimated that approximately 44 percent of all households in the service area are "very-low" or "low" income. In the absence of more detailed information, this percentage was assumed to apply to households across the service area. Water usage by low-income households has been included in future demand projections in **Table 7-5.**

7.2.4 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

7.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets the City developed and demonstrates that compliance by 2020 was achieved.

Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for RHWC's calculations are included in **Part 4 Appendix G-7**.

7.3.1 Baseline and Target

RHWC's baseline and 2020 target was calculated in the 2015 RUWMP and has not changed for this plan. More details on the development of the baselines and target can be found in the 2015 RUWMP and **Part 4 Appendix G-7**. RHWC's calculated water use target for 2020 is 191.7 GPCD.

7.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, RHWC has met its Confirmed Water use Target for 2020 of 171 GPCD, as shown in **Table 7-7**. To maintain this level of water use, RHWC intends to continue its current level of outreach and programs for the foreseeable future.

Table 7-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
192	183	Yes

7.4 Water Supply

RHWC's water supply is comprised entirely of local groundwater.

7.4.1 Purchased or Imported Water

RHWC does not currently purchase imported SWP water or other supplies.

7.4.2 Groundwater

RHWC extracts potable water from the San Bernardino Basin (SBB, including the Bunker Hill Basin and Lytle Basin) and the Riverside Arlington Basin (including the Riverside North Basin and Riverside South Basin). Detailed discussions of each basin, water rights and management are included in **Part 1 Chapter 3**.

RHWC currently has 13 wells capable of producing water. Two of these wells, RN-21 and RN-22 are dedicated to providing non potable irrigation water due to high nitrate concentrations. Three wells, FW-2, FW-5 and FW-18 are being used for the groundwater reduction program in the Bunker Hill Basin. These three wells can be converted to domestic water production if required. RHWC recently constructed a new well in the Riverside North Basin, RN-26, which went online in 2021.

RHWC has entered into an agreement with Valley District (SBVMWD Legal Document 1487, approved January 18, 1990) for a maximum flow rate of 1,000 gallons per minute from the Baseline Feeder project. The maximum quantity RHWC can receive in any calendar year is 1,000 acre-feet from this pipeline. Water obtained through this agreement is assessed against RHWC's water right in the SBB. This agreement was made with the understanding that it is a standby agreement and the water delivery is to be made only at RHWC's request.

As described in **Part 1 Chapter 3**, for Riverside North, the base period extraction is set only for that which is used within Riverside County. The Western Judgment established 21,085 AF as the base period export right for the use of Riverside North groundwater in Riverside County. Should extractions exceed the base period extraction over a 5-year period, or by more than 20 percent in a single year, Western is responsible for replenishment in the following year equal to the excess extractions over a 20-percent peaking allowance. Western's replenishment obligation can be reduced through credits that are available from previous years due to importing water into the basin or production below the base period extraction.

For Riverside South, the Western Judgment set a 5-year base period extraction of 29,633 AF for use in Riverside County. In Riverside South, should extractions exceed the base period extraction over a 5-year period, or by more than 20 percent in a single year, Western is responsible for replenishment in the following year equal to the excess extractions over a 20 percent peaking allowance, unless credits are available from previous years due to productions below the base period extraction or to importing water.

As of the 2020 Watermaster Annual Report, Western has total credits of 544,221 AF for the Rialto-Colton and Riverside Basins combined. To avoid confusion, the Watermaster no longer allocates this credit among the different groundwater basins.

RHWC's historical groundwater production for the past five years is shown in **Table 7-8**.

Table 7-8. DWR 6-1R Groundwater Pumped Last Five Years (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Riverside Arlington (Riverside North)	1,756	2,031	1,509	1,050	958
Alluvial Basin	Riverside Arlington (Riverside South)	81	124	158	204	248
Alluvial Basin	SBB (Lytle)	1,300	1,463	1,633	1,886	2,507
Alluvial Basin	SBB (Bunker Hill)	-	-	565	612	533
	Total:	**3,137**	**3,617**	**3,865**	**3,753**	**4,246**

7.4.3 Surface Water

RHWC currently has no plans for future use of surface water supplies.

7.4.4 Stormwater

RHWC is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the basins RHWC produces water from. These regional projects are discussed in **Part 1 Chapter 3**.

7.4.5 Wastewater and Recycled Water

The City of Colton provides wastewater collection and treatment for the area in which RHWC serves water. Some areas in RHWC's water service area are still served by septic tanks.

The City of Colton owns, operates and maintains a wastewater collection, pumping and treatment system. The wastewater treatment plant utilizes a conventional and extended aeration secondary treatment process to product treated effluent in compliance with Regional Water Quality Control Board regulations. Treated effluent from Colton's wastewater treatment plant is conveyed to the Rapid Infiltration-Extraction (RIX) facility, which Colton jointly owns with SBMWD. The RIX facility treats a combined secondary-treated effluent stream of approximately 5 million gallons per day (MGD) from Colton's WWTP and 20 MGD from the San Bernardino Water Reclamation Plant to tertiary standards. The RIX facility utilizes natural biofiltration through the use of percolation basins, followed by an ultraviolet disinfection system. All of the RIX-treated water is discharged to the Santa Ana River.

The City of Colton currently treats 0.8 to 1.2 MGD of wastewater from RHWC's service area, in addition to the City of Colton's service area. For the purposes of calculations, RHWC assumes an average of 1.0 MGD is conveyed from the City of Grand Terrace.

> It is estimated that approximately 21% or 1 MGD of the wastewater collected at the City of Colton WWTP was generated within Colton's water service area in 2020.

Information about wastewater collected and treated is presented in **Table 7-9**.

7.4.5.1 Potential, Current, and Projected Recycled Water Uses

No recycled water is currently used in the RHWC service area. While RHWC recognizes the value of recycled water, construction of such facilities is cost prohibitive at this time and the City of Colton does not have a recycled water program, so no recycled water use is anticipated during the period covered by this Plan. However, recycled water is utilized by the region for meeting habitat needs in the Santa Ana River (see **Part 1 Chapter 3.4**).

Table 7-9. DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
City of Colton	Estimated	1,184	City of Colton	Colton Water Reclamation Facility	No	No
-	**TOTAL**	**1,184**				

7.4.6 Water Exchanges and Transfers

RHWC does not anticipate regular or long-term transfers or exchanges, during the period covered by this Plan. Any transfer or exchanges would be as-needed related to an emergency.

7.4.6.1 Emergency Interties

RHWC has Emergency Interties with the City of San Bernardino, City of Colton and the City of Rialto. In 2018, RHWC received 187 AF of water from the City of San Bernardino and has delivered water to the City of Colton.

In addition, the City of Riverside owns shares of stock in RHWC and obtains their share of water by In-Lieu-Pumping. RHWC's agreement with the City of Riverside is included in **Part 4 Appendix G-4.**

7.4.7 Future Water Projects

RHWC is currently preparing a well siting study to identify potential sites for a new production well in the SBB or Riverside North Basin as part of the SARCCUP project described in **Part 1 Chapter 3.** RHWC does not have any other projects planned to develop additional supplies at this time.

7.4.8 Summary of Existing and Planned Sources of Water

RHWC's water supply is comprised entirely of local groundwater and will continue to be for this plan period. As discussed in **Part 1 Chapter 5**, RHWC is applying a Reliability Factor of 15% to their supply reliability analysis to account for uncertainties in supply and demand projections. The 15% value is recommended in a study by the RAND Corporation that evaluated uncertainty factors in the regional supplies and demands, including population growth, per capita water use, climate change impacts on supplies and demands, SWP project supplies and local surface water supplies. See **Part 1 Chapter 5** for more details on how the Reliability Factor was established. For the purposes of supply projections in this 2020 IRUWMP, RHWC is using the 15% Reliability Factor to establish a supply target of 15% more than total projected demand. The volume of water utilized from each source in 2020 is summarized in **Table 7-10** and projected supply by source is summarized in **Table 7-11**.

Table 7-10. DWR 6-8R Actual Water Supplies in 2020 (AF)

		2020		
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	Riverside North	958	Drinking Water	See note
Groundwater (not desalinated)	Riverside South	248	Other Non-Potable Water	See note
Groundwater (not desalinated)	SBB (Lytle)	2,507	Drinking Water	See note
Groundwater (not desalinated)	SBB (Bunker Hill)	533	Drinking Water	See note
-	**TOTAL**	**4,246**		

See Part 1 Chapter 3 for discussion of Rights and Safe Yield

Table 7-11. DWR 6-9R Projected Water Supplies (AF)

		PROJECTED WATER SUPPLY				
		2025	2030	2035	2040	2045
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	Riverside North	3,176	3,399	3,622	3,736	3,850
Groundwater (not desalinated)	Riverside South	250	250	250	250	250
Groundwater (not desalinated)	SBB (Lytle)	1,800	1,800	1,800	1,800	1,800
Groundwater (not desalinated)	SBB (Bunker Hill)	-	-	-	-	-
	TOTAL	**5,226**	**5,449**	**5,672**	**5,786**	**5,900**

Supplies shown in this table are planned pumping or diversions, except supplies from San Bernardino Basin are increased to meet the Total Supply Target with 15% Reliability Factor.

Table 7-12. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	5,226	5,449	5,672	5,786	5,900
Demand Totals From Table 4-3R	4,545	4,738	4,932	5,031	5,131
DIFFERENCE	**681**	**711**	**740**	**755**	**769**

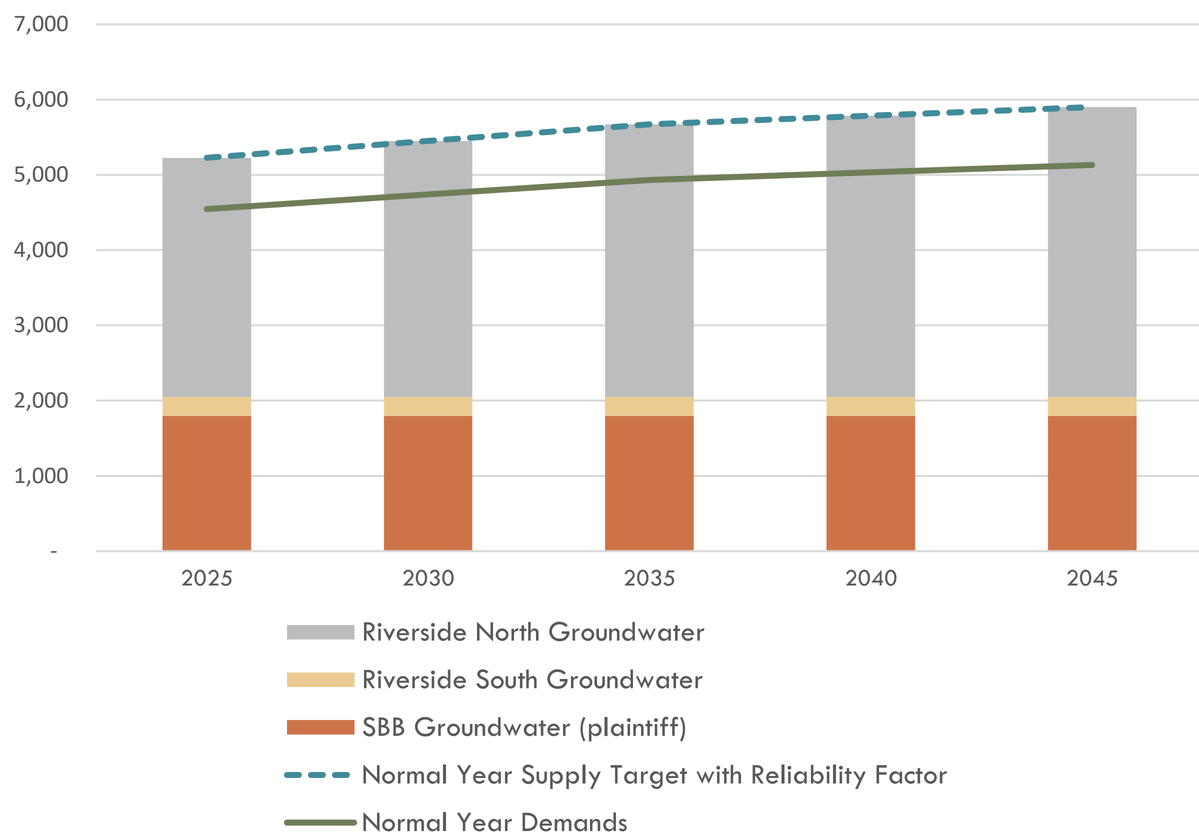


Figure 7-4: RHWC Projected Supply and Demand Comparison (AF)

7.4.9 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2020, RHWC consumed a total of 3,406,430 kWh of energy for water facilities for an energy intensity of 802 kWh per AF of water delivered.

7.5 Water Service Reliability Assessment

This section considers RHWC's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from RHWC's current source of supply through 2045.

7.5.1 Constraints on Water Sources

In general, groundwater is 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 BTAC, monitor groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management and challenges is included in **Part 1 Chapter 3**.

Based on current conditions, water quality is not expected to affect RHWC's supply reliability. However, water quality issues are constantly evolving. RHWC will take action to protect and treat supplies when needed, though water quality treatment is known to have significant costs. These water quality issues are further discussed at a regional level in **Part 1 Chapter 3**.

7.5.2 Year Type Characterization

Per UWMP requirements, RHWC has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition 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.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

7.5.3 Water Service Reliability

The results of the reliability assessment are summarized in the tables below.

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. 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% increase throughout the 5-year drought to be conservative.

As described in **Part 1 Chapter 3**, the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. RHWC, Valley District, and Western have demonstrated that water supplies will meet the water demands in normal, single dry and multiple dry years, as discussed in **Part 1 Chapter 5**. RHWC has the right to extract 4,435 AFY of water in the SBB with a five-year average representing their water right (see **Part 1 Chapter 3.8** for more information). In the Riverside

North and Riverside South Basins, RHWC is able to pump more water to meet demands in dry years in accordance with the Western Judgment. Although Western has substantial credits according to the 2020 Watermaster Annual Report, RHWC and Western are participating in efforts to replenish the basins with imported and local water through regional recharge programs. RHWC's total groundwater supplies are not reduced in dry years so 2020 is considered the base year for all year types. Based on the analysis, RHWC does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, RHWC participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. RHWC also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 7-13**. The percent of average supply increases in drought years because RHWC's groundwater production will increase to meet an assumed increase in demands.

Table 7-13. DWR 7-1R Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS AS PERCENT OF AVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a normal year are shown in **Table 7-12**.

The projected supply and demand during a single dry year are shown in **Table 7-14**. RHWC's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basins RHWC produces water from have storage for use in dry years so RHWC can produce the volume of water needed to meet 100% of demands in single dry years. RHWC's supplies are 100% reliable during single dry years.

Table 7-14. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals	5,749	5,994	6,239	6,365	6,490
Demand Totals	4,999	5,212	5,425	5,534	5,644
DIFFERENCE	**750**	**782**	**814**	**830**	**847**

The projected supply and demand during five consecutive dry years are shown in **Table 7-15**. RHWC's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins RHWC produces water from have storage for use in dry years so RHWC can produce the volume of water needed to meet 100% of demands in multiple dry years. RHWC's supplies are 100% reliable during multiple dry years.

Table 7-15. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
FIRST	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**
SECOND	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**
THIRD	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**
FOURTH	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**
FIFTH	Supply Totals	5,749	5,994	6,239	6,365	6,490
YEAR	Demand Totals	4,999	5,212	5,425	5,534	5,644
-	**DIFFERENCE**	**750**	**782**	**814**	**830**	**847**

7.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because RHWC relies on groundwater basins with significant storage, available supplies do not vary on a monthly or seasonal basis, so this analysis is conducted on an annual basis. Projected demands and supplies from 2021-2025 are shown in **Table 7-16**.

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. This DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in **Section 7.5** and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for RHWC. RHWC can produce additional groundwater to meet any increases in demand in dry years. As shown in **Part 1 Chapter 5**, the region as a whole has sufficient supplies to meet demands plus the 15% Reliability Factor, even in a 5-year drought. As shown in **Part 1 Chapter 5 Figure 5-1**, the SBB had over 4.8 million acre-feet in storage as of 2020 due to regional efforts to store water in wet years for use during dry years.

Although projections in this Plan show that the regional water supplies are sufficient to meet the demands of RHWC and the region as a whole, even during a 5-year drought (see **Part 1 Chapter 5**), RHWC remains committed to water conservation and to being a good steward of regional water resources to preserve supply for the future due to the possibility of experiencing more severe droughts than anticipated in this Plan.

Table 7-16: Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	4,736
	Total Supplies	5,447
	SURPLUS	**711**
2022	Gross Water Use	4,802
	Total Supplies	5,522
	SURPLUS	**720**
2023	Gross Water Use	4,868
	Total Supplies	5,598
	SURPLUS	**730**
2024	Gross Water Use	4,933
	Total Supplies	5,673
	SURPLUS	**740**
2025	Gross Water Use	4,999
	Total Supplies	5,749
	SURPLUS	**750**

7.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that RHWC 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 a number of reasons, such as water supply 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 RHWC 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 RHWC maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. RHWC's WSCP is attached as Part 4 Appendix G-9.

7.8 Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that RHWC has implemented for the past five years, is currently implementing, and plans to implement in order to promote efficient water use. RHWC's current per-capita consumption is less than its 2020 compliance target. RHWC expects to continue to implement current conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

7.8.1 Existing Demand Management Measures

7.8.1.1 Water Waste Prevention Ordinances

RHWC has adopted a water shortage contingency plan that has a water waste prohibition. RHWC will initiate an aggressive water commodity tiered rate structure to discourage water wasting, if the 20% reduction in per capita use is not met. Large water users have been identified and an aggressive education program for water conservation has been initiated to prevent water waste.

7.8.1.2 Metering

RHWC has implemented a program to completely replace all of its meters with automated meter readers (AMR). The AMR program is in effect with all meters now AMR. RHWC has begun to replace those automated meters that are over 10 years old and will replace older meters continuously.

7.8.1.3 Conservation Pricing

In 1985, RHWC commissioned a “Revenue Requirement Study” to determine the revenue required for each class of service to pay its fair share of monies to operate and maintain the domestic and irrigation water systems. During the study it was noted that a waste of water was occurring by some customers and some irrigation customers were not metered. The rate structure at the time was for assessments to pay for water usage and a declining rate for water in excess of that amount represented by the assessment. In 1986, the RHWC Board of Directors accepted the Revenue Requirement Study and began to implement the new rate structure. Prior to beginning the new water rates, RHWC staff began a public information and education series of talks to the City of Grand Terrace, its largest customer base, service clubs and information centers at community gatherings. When the rates were implemented, public acceptance was overwhelming.

RHWC completed an additional rate study (2019) to further reduce water consumption and match fixed revenue sources to fixed revenue expenditure, along with matching variable revenue sources to variable revenue expenditure. The current rates are shown in **Table 7-17.**

Table 7-17. Domestic Water Rates for RHWC as of 2020

UNITS PER 2 MONTHS	RATE PER UNIT
0 to 4,000	$1.06
4,001 to 7,000	$1.38
7,001 to 11,000	$1.63
Over 11,001	$1.87

The water rate structure is designed as an increasing charge for water as usage increases. Water meter readings are done bi-monthly. By adjusting the tier allotments and tier rates, RHWC has the ability to significantly increase water conservation.

If the 20% per conservation reduction is not met, the tier allotments would decrease and commodity rates for Tiers 2, 3 and 4 would be increased until the mandatory reduction in per capita water use would be met. It has been determined that 20 units (100 cubic feet = 1 unit) of water per 2-month period is the lifeline amount being used by customers for inside water use. Subsequent to 2020, all of the Tier rates will increase to match inflation.

This rate structure, along with the other RHWC programs, is planned to greatly reduce the water running down gutters and other water wasting habits. With agriculture being phased out, irrigation will be for landscaping and open space purposes.

7.8.1.4 Public Education and Outreach

In 1989, RHWC initiated an “In-Home Water Audit Program” to review customers in-house and outdoor uses and habits. The audit is performed at the request of the Customer or, it may be recommended by employees reviewing historic water usage against a high usage meter reading in any particular period of time. Upon completion of the water usage audit, recommendations are made to the homeowner to reduce water usage. RHWC personnel will follow up with the customer to review the recommendations made as a result of the audit. No record of water saved through this program has been maintained. It is believed that a significant reduction of water usage has been realized after an audit has been made and the employee recommendations have been implemented for individual customers.

Annually, the City of Grand Terrace which RHWC provides water service becomes involved with Water Awareness Month, including passing a Water Conservation Resolution and prominently displaying the winning poster from the schools during Water Awareness Month poster contest.

In the past, RHWC has sponsored and manned a booth at the City of Grand Terrace “Annual Merchants Fair”. At this booth, water conservation literature is available to participants and the personnel will answer questions and discuss water matters with the people who are normally RHWC customers. RHWC also has a water conservation booth annually at both the Grand Terrace Days and Highgrove Days.

RHWC maintains a literature rack in the lobby of the Corporate Offices. There are booklets and literature available at the booths sponsored by RHWC. An example of the literature available follows:

- Water Conservation Hints: This is a pamphlet prepared by RHWC as a handout to new customers or interested people.
- Drought Tolerant Plants: This is a handout prepared by RHWC and available in our lobby and upon request for our customers or interested parties.
- The website for IEfficient.com: This a website we refer our customers to for additional information. The Inland Empire's go-to source for information on water-use efficiency. Here you will find tips for increasing conservation and, most importantly, ways to eliminate water waste.

In 1991, in conjunction with the Colton Unified School District's "Partners in Education Adopt-A-School Program" RHWC adopted Terrace View Elementary School in the City of Grand Terrace. RHWC provides water service to the City of Grand Terrace. RHWC staff provide instruction about water resources, how water gets to the tap in your home, water conservation and the water business operations.

This "Adopt-A-School Program", now in its 30th year, utilizes classroom work by the teacher and RHWC employees, supervised tours to the Western Municipal Water District of Riverside County's "Low Water Use Demonstration Garden", the Metropolitan Water District of Southern California's Mills Water Treatment Plant, Oliver Roemer Water Filtration Plant, a water testing laboratory, an EPA Superfund Site, and the corporate facilities and operation facilities of RHWC.

On May 30, 2002, RHWC adopted a second school, Grand Terrace Elementary School, in the "Partners in Education, Adopt-A-School Program".

Each year, RHWC sponsors a "Water Awareness Poster" contest, which includes both schools during Water Awareness Month. Awards, which are engraved plaques are awarded to two winners in each school grade level. RHWC personnel are requested to judge the Annual Science Fair, both at the local school and district wide level. The Grand Prize Winner in the Poster Contest for each school is presented with a $100.00 U.S. Savings Bond sponsored by RHWC.

RHWC has no large commercial, industrial, or institutional accounts.

7.8.1.5 Programs to Assess and Manage Distribution System Real Losses

RHWC has already replaced all of the water meters with automated meters to help detect both meter leaks and leaks within the customer's property. During the regular reading duties, the meter and joining pipelines are reviewed for water leakage. Where water is noted in the reading of the meter, a service technician is dispatched to the location of the possible leak to evaluate the situation. Any leaks found, whatever the size, are repaired immediately. It has been the experience of RHWC that approximately 5.5% of the meters in the distribution system have small leaks in any one year. The automated water meters will enable RHWC to detect leaks within the customer's system. RHWC plans to initiate this customer leak detection program when the automated meter program is completed.

Meters that are noticeably not providing proper readings during the reading period and in the calculations for water used as compared to historic usage by water billing personnel will be evaluated and replaced or repaired as the situation requires. RHWC's "Water Meter Change-Out Program" commenced in 1981 and is continuing today. RHWC is replacing all of its water meters with new automated water meters. The "Meter Change-Out Program" will continue as an on-going program to ensure proper reading meters are being utilized within the distribution system.

RHWC has had an ongoing leak detection system that has been in place since 1989. RHWC has not keep a detailed accounting of how much water this program has conserved.

RHWC has a Capital Replacement Program that includes the replacement of water mains, valves, fittings and water service connections from the water main to the customer meter. Please note that all water sold is through meters regularly checked for accuracy. After replacing all of its water mains, RHWC has lowered its nonrevenue water.

7.8.1.6 Water Conservation Program Coordination and Staffing Support

RHWC had been experiencing reservoir overflows, water mixing problems in reservoirs and the need for excessive water flushing due to low water in reservoir problems. In response to these problems, RHWC installed a "State-Of-The-Art" Supervisory Control and Data Acquisition System (SCADA) in the water distribution system. Since the installation of the SCADA system, proper water levels in the reservoirs are maintained, and the use of "Time-of-Use" (TOU) electrical energy usage has been practicable, reducing energy bills to RHWC. The proper use of booster stations and the ability to utilize the most efficient and lowest cost water producing wells can be determined and operated by RHWC. In addition, records of operation are stored within the computer files for future reference to evaluate water distribution system. The RHWC distribution superintendent will be the water conservation coordinator.

7.8.1.7 Other Demand Management Measures

RHWC has very few large landscape irrigation areas within its service area. RHWC currently offers non-potable water to a number of parks, open spaces and irrigation areas. RHWC has met with all of the large landscape owners. RHWC has initiated an informal program for water conservation for all of its large landscape customers. RHWC does not have a formal landscape conservation program or incentives, and does not plan to implement this type of program in the near future, but will continue to monitor the large landscape projects for cooperation in conservation.

RHWC does not currently have programs involving residential retrofits, large landscaping conservation programs and incentives, conservation programs for commercial, industrial, and institutional accounts, wholesale agency programs, water waste prohibition, or residential ultra-low flush toilet replacement programs. If RHWC's aggressive water commodity pricing rate schedule and its education programs do not meet the required future water use objectives, RHWC will initiate the above mentioned water conservation programs.

7.9 Adoption, Submittal and Implementation

This section describes RHWC's process for adopting, submitting, and implementing the 2020 IRUWMP and RHWC's WSCP.

7.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to RHWC's public hearing. The recipients are identified in Chapter 2 and include all cities and counties within RHWC's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

RHWC provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in **Part 4 Appendix G-2**.

7.9.2 Public Hearing and Adoption

RHWC held a public hearing on June 24, 2021 to hear public comment and consider adopting this 2020 IRUWMP and RHWC's WSCP.

As part of the public hearing, the RHWC provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed RHWC the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

RHWC's adoption resolution for the 2020 IRUWMP and RHWC's WSCP is included in **Part 4 Appendix G-3**.

7.9.3 Plan Submittal

RHWC will submit the 2020 IRUWMP and RHWC's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. 2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

7.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, RHWC will make the plan available for public review during normal business hours by placing a copy of the 2020 IRUWMP and RHWC's WSCP at the front desk of the City's office, and by posting the plans on the City's website for public viewing.

7.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or RHWC's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

CITY OF SAN BERNARDINO

2020 IRUWMP

Part 2 Chapter 8

SBMWD 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

WSC

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

8 RETAIL URBAN WATER MANAGEMENT PLAN
SBMWD

This chapter describes information specific to the San Bernardino Municipal Water Department (SBMWD), its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the SBMWD's reporting requirements for 2020 under the UWMP Act.

SBMWD was created as a municipal utility by Article 9 of the City of San Bernardino Charter, as adopted on January 6, 1905. SBMWD is governed by a Board of Water Commissioners appointed by the Mayor and subject to confirmation by the City Council. The first Board of Water Commissioners was appointed May 1905. The initial water distribution system, valued at $160,000 in 1905, covered just one square mile and served a population of only 6,000 people.

SBMWD's service area is shown in **Figure 8-1**.

IN THIS SECTION

The SBMWD service area has expanded to include a majority of the City of San Bernardino and portions of unincorporated areas of the County of San Bernardino. The area is bounded on the north by the San Bernardino National Forest, on the east by the East Valley Water District and Redlands Municipal Utilities Department, on the south by the cities of Loma Linda and Colton, and on the west by the West Valley Water District, the City of Rialto, and the Muscoy Mutual Water Company.

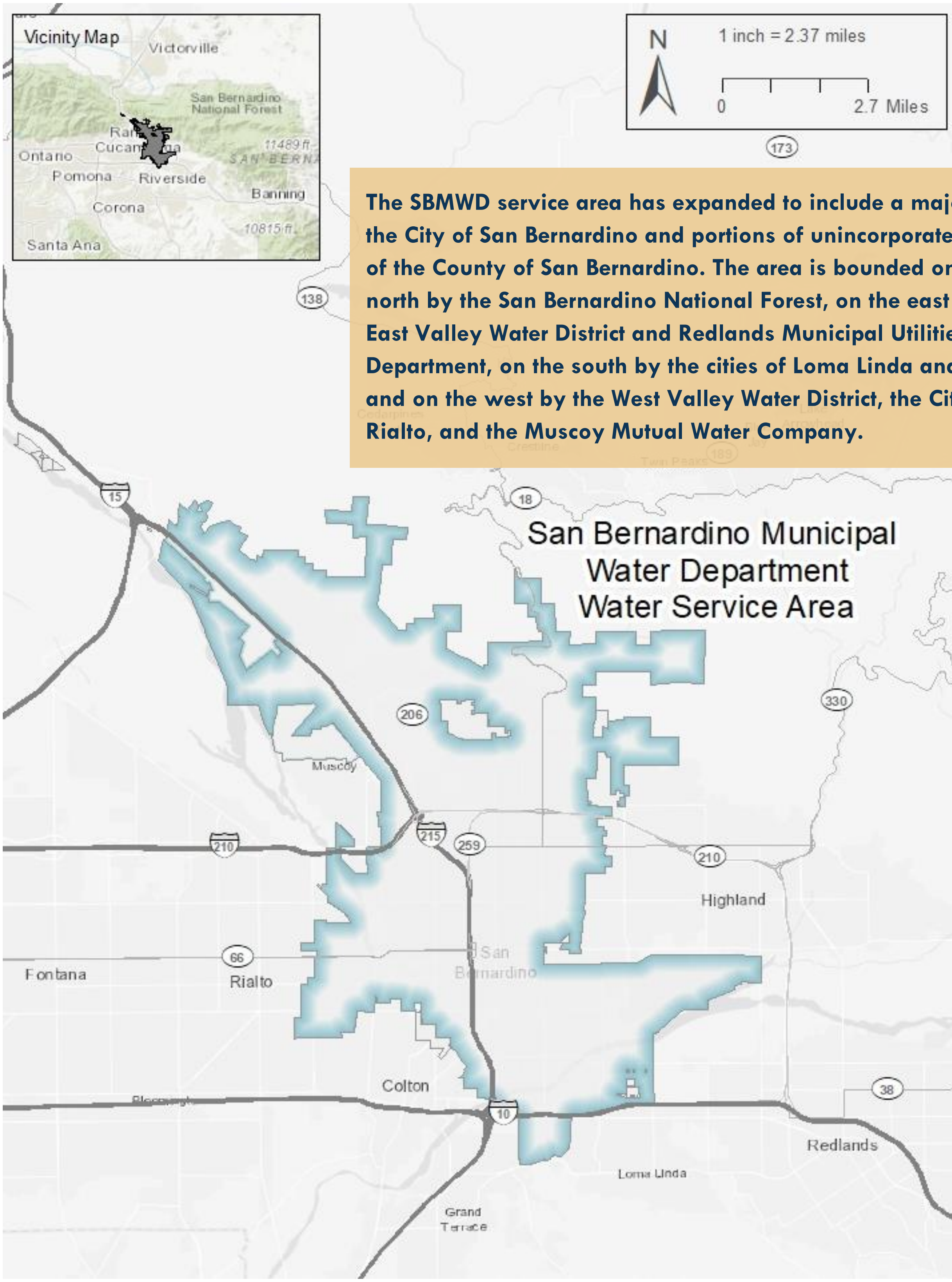


Figure 8-1: SBMWD Water Service Area Map

8.1 Service Area

Elevations of the valley floor range from approximately 1,000 feet above sea level at the southern boundary, to an elevation in excess of 2,100 feet above sea level at its northern-most boundary.

SBMWD is a retail public water supplier that meets the definition of an urban water supplier with over 45,400 municipal water service connections in 2020. The regional climate, which includes SBMWD's service area, is described in **Part 1 Chapter 2** of the 2020 IRUWMP.

8.1.1 Population

For the purposes of consistent reporting of population estimates, the California Department of Water Resources (DWR) has developed a GIS-based tool (DWR Tool) to estimate the population within a water agency's service area using census data and number of water service connections. The DWR Tool was used to intersect the service area boundary with census data to provide population estimates for 1990, 2000, and 2010. The DWR Tool uses the number of service connections in those prior census years, where available, to calculate a persons-per-connection factor, which is then projected forward to estimate population in a given year using the number of connections in that year. The service area population for 2020 was estimated in the DWR Tool using the number of connections in 2000, 2010 and 2020.

To estimate population for future years, projections from the Southern California Association of Governments (SCAG) were used. SCAG has developed a forecast called the 2020 Connect SoCal Regional Transportation Plan and has estimated the population, households, and employment in 2020, 2035, and in 2045 inside each of the approximately 11,300 traffic analysis zones (TAZs) that cover the SCAG region. The service area boundary was intersected with a GIS shapefile of the SCAG TAZs to provide an estimate of population within the service area for years 2020, 2035, and 2045. These estimates were used to calculate compound annual population growth rates for years 2020-2035 and 2035-2045. The population growth rates were applied to the 2020 population to estimate future population. Estimated 2020 and future year population is shown in **Table 8-1**.

Per SCAG requirements, it must be noted that this population modeling analysis was performed by Water Systems Consulting, Inc. based upon modeling information originally developed by SCAG. SCAG is not responsible for how the model is applied or for any changes to the model scripts, model parameters, or model input data. The resulting modeling data does not necessarily reflect the official views or policies of SCAG. SCAG shall not be held responsible for the modeling results and the content of the documentation.

SCAG prepares demographic forecasts based on land use data for their region through extensive processes that emphasizes input from local planners and is done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

Table 8-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
TOTAL	**210,830**	**217,221**	**223,806**	**230,591**	**236,206**	**241,958**

8.1.2 Land Use

Per the 2017 City of San Bernardino General Plan Land Use Element, 39% of the City of San Bernardino is residential, 10% is commercial, 14% is industrial, 10% is flood control, 9% is public facilities, 14% is road right of way, and 4% is public parks, open space, and recreation facilities.

8.2 Water Use

This section describes the current and projected water uses within SBMWD's service area. SBMWD serves potable water for domestic use and uses raw water for irrigation at the San Bernardino Water Reclamation Plant. This section addresses potable water demand and provides for the reporting of raw water demand delivered for urban use for the year 2020. Future recycled water use is discussed in **Section 8.4.5.**

8.2.1 Water Use by Sector

SBMWD categorizes its retail water customers into six categories for the purposes of billing: Residential – Single Family, Residential – Multi-Family, Commercial/Institutional + Government, Industrial, Landscape Irrigation, and Fire Service. SBMWD also intermittently delivers wholesale water to the City of Rialto, West Valley Water District, and Riverside Highland Water Company via the Encanto Booster Station. The number of active connections in each category from 2016 to 2020 are shown in **Table 8-2**.

Table 8-2: SBMWD 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential – Single Family	35,680	35,738	36,970	35,797	35,952
Residential – Multi-Family	2,889	2,898	2,985	2,893	2,917
Commercial/Institutional + Municipal	3,147	3,173	3,282	3,118	3,174
Industrial	-	-	-	-	-
Landscape Irrigation	1,124	1,133	1,205	1,173	1,188
Fire Service	1,875	1,940	2,095	2,099	2,172

Other Agencies	10	10	15	10	10
TOTAL	**44,725**	**44,892**	**46,552**	**45,090**	**45,413**

8.2.1.1 Past Water Use

SBMWD's actual water use by customer class from 2016-2020 is shown in **Table 8-3**. SBMWD's water consumption by customer class in the last five years is shown in **Figure 8-2**.

> Approximately 51% of SBMWD's total deliveries were to single Residential – Single Family connections, followed by 17% to Commercial/Institutional + Municipal connections, 17% to Landscape Irrigation connections, 16% to Residential – Multi-Family connections, and the remainder to fire services.

Table 8-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential – Single Family	15,905	16,764	17,199	15,995	18,159
Residential – Multi-Family	5,388	5,392	5,502	5,322	5,661
Commercial/Institutional + Municipal	6,296	6,532	6,492	5,823	6,142
Landscape Irrigation	5,042	5,612	5,891	5,325	5,962
Fire Service	24	24	25	28	27
Other Agencies	1	3	88	2	2
Water Losses	3,648	4,388	3,570	3,474	4,155
Raw Water[1]	973	617	130	1,871	2,075
TOTAL	**37,276**	**39,331**	**38,897**	**37,840**	**42,182**

[1]Dewatering wells used for irrigation and operations at the San Bernardino Water Reclamation Plant.

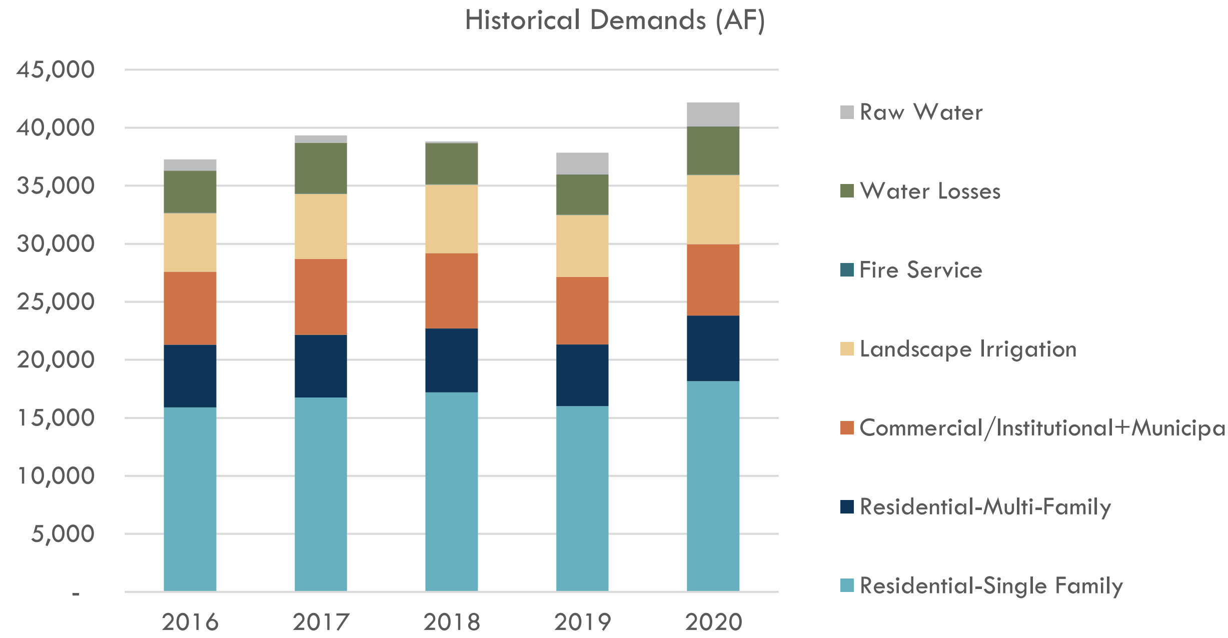


Figure 8-2: SBMWD 2016-2020 Water Consumption by Customer Class (AF)

8.2.1.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water.

Sources of water loss include:

- Leaks from water lines - Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall water loss. Aging pipes typically have more leaks.
- Water used for flushing and fire hydrant operations
- Unauthorized uses or theft of water
- Customer Meter Inaccuracies - Customer meters can under-represent actual consumption in the water system.

SBMWD monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4 Appendix H-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 8-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020.

SBMWD will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 8-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS*
1	2016	3,492
1	2017	4,056
1	2018	3,821
1	2019	3,507
1	2020	4,155 (Estimated)

In the past 5 years, SBMWD's water loss has ranged from 9% - 13% of water sales. For the purposes of future water use projections, water loss is assumed to be 11% of projected water sales.

SBMWD is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standard that is being developed by the State Water Board. Programs to manage water loss are described in 8.8.1.5. These programs will increase the efficiency of the water distribution system by decreasing future water losses; however, water losses cannot be prevented entirely.

Water mains are replaced to minimize water losses in the Distribution System

8.2.2 Projected Water Use

A demand forecast tool was developed to estimate future demands based on individual customer categories and connections, with the ability to forecast how future changes in indoor and outdoor water use may impact overall water use within each different customer type for current and future customers.

The tool has three steps to project demand:

1. Establish a demand factor per connection for each customer class based on historical consumption data.
2. Project the number of new connections anticipated for each customer class in each 5-year period after 2020.
3. Modify demand factors as appropriate to account for expected changes in future water use.

The demand factors for each customer class were based on connection and demand data from 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.

> The resulting projection was compared to the City's knowledge of growth patterns within the service area and determined to be a reasonable projection of expected growth.

To estimate future water use for each customer category, the demand factor is multiplied by the number of estimated new connections and added to the 2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the total future water use. Non-potable water demands at the San Bernardino Water Reclamation Plant were assumed to be equal to average consumption from 2016-2020, however, beginning in 2022 those non-potable demands will be met by recycled water (see **Section 8.4.5**) rather than raw water produced from the dewatering wells at the Water Reclamation Plant. Projected future demands by customer class as well as estimated losses are presented in **Table 8-5**, **Table 8-6**, and **Figure 8-3**.

Table 8-5: DWR 4-2R Projected Demands for Water (AF)

	PROJECTED WATER USE				
CUSTOMER CLASS	2025	2030	2035	2040	2045
Residential-Single Family	18,710	19,260	19,811	20,253	20,695
Residential-Multi-Family	5,832	6,004	6,175	6,313	6,451
Commercial/Institutional + Municipal	6,328	6,514	6,701	6,850	7,000
Landscape Irrigation	6,143	6,323	6,504	6,649	6,795
Fire Service	28	28	29	30	30
Water Losses	4,074	4,194	4,314	4,411	4,507
Raw Water[1]	-	-	-	-	-
TOTAL:	**41,115**	**42,325**	**43,534**	**44,506**	**45,478**

[1]Beginning in 2022, non-potable demands at the San Bernardino Water Reclamation Plant will be met by direct recycled water use rather than the existing dewatering wells. The dewatering wells will remain in standby mode in case needed for dewatering purposes in the high groundwater zone.

Table 8-6: DWR 4-3R Total Gross Water Use (AF)

-	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	42,218	41,115	42,325	43,534	44,506	45,478
Recycled Water Demand* From Table 6-4R	-	1,133	1,133	1,133	1,133	1,133
TOTAL WATER USE:	**42,218**	**42,248**	**43,458**	**44,667**	**45,639**	**46,661**

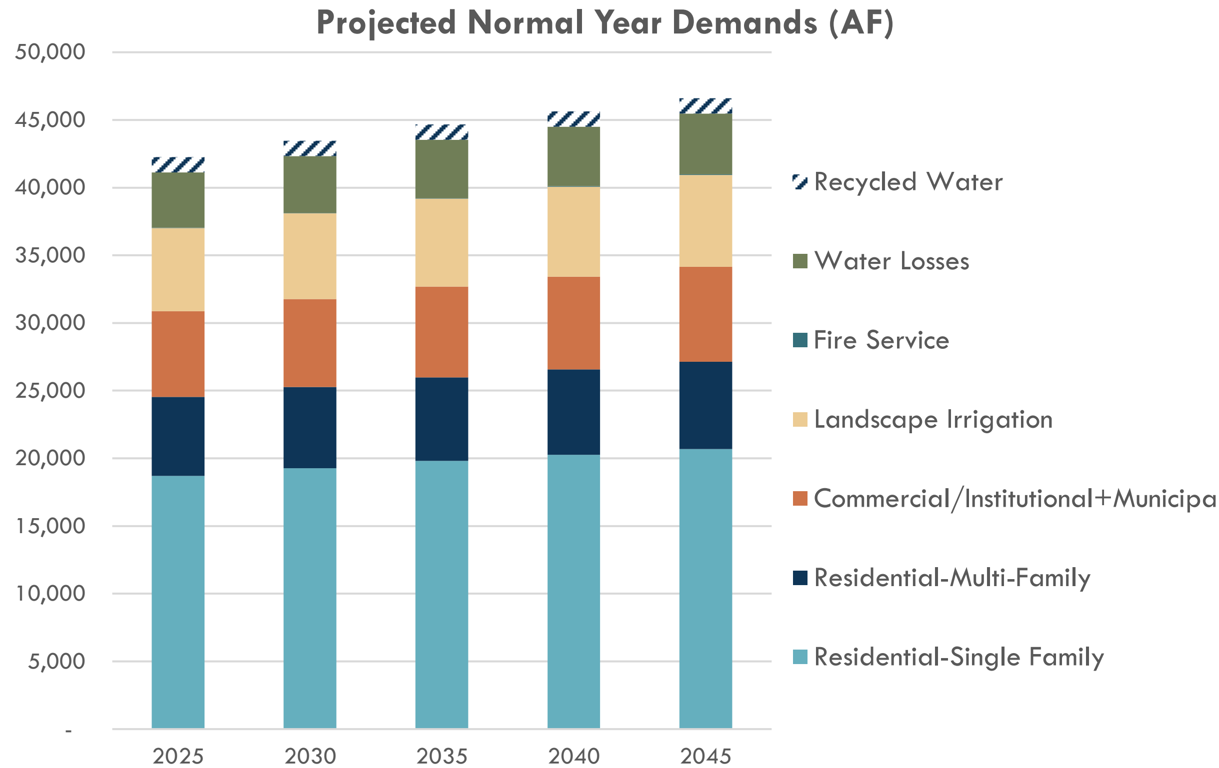


Figure 8-3: SBMWD Projected Future Water Consumption by Customer Class (AF)

8.2.2.1 Estimating Future Water Savings

The demand tool used to project future water use has the capability to modify demand factors for both new and existing connections to quantify reductions in current and future customer demand that may occur as a result of active conservation programs implemented by SBMWD or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. SBMWD may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, SBMWD has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of SBMWD's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, SBMWD will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. SBMWD is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

8.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. The SBMWD contains two jurisdictions, the City of San Bernardino and unincorporated County of San Bernardino.

Based on the City of San Bernardino's 2013-2011 Housing Element, 50 percent of households are lower-income, which is defined as an income of less than 80% of the City-wide average median income. In the absence of more detailed information, this percentage was applied across the SBMWD service area. These demands have been included in the projections presented in **Table 8-5**.

8.2.4 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

8.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets the City developed and demonstrates that compliance by 2020 was achieved.

> Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for SBMWD's calculations are included in **Part 4 Appendix H-7**.

8.3.1 Baseline and Target

SBMWD's baseline and 2020 target was calculated in the 2015 RUWMP and has not changed for this plan. More details on the development of the baselines and target can be found in the 2015 RUWMP and **Part 4 Appendix H-7**. SBMWD's calculated water use target for 2020 is 203 GPCD.

8.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, SBMWD has met its Confirmed Water use Target for 2020 of 203 GPCD, as shown in **Table 8-7**. To maintain this level of water use, SBMWD intends to continue its current level of outreach and programs for the foreseeable future.

Table 8-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
203	179	Yes

8.4 Water Supply

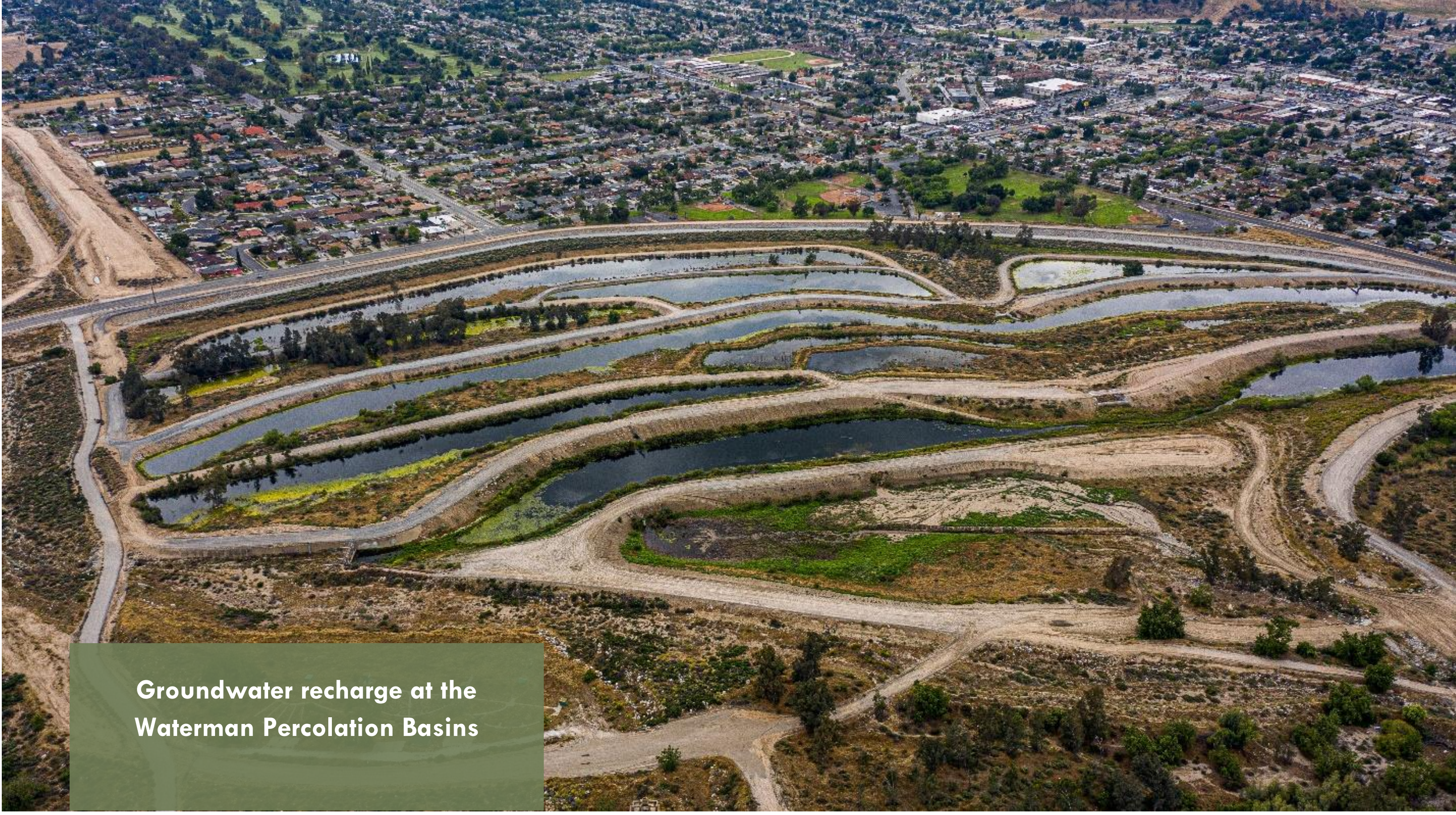
SBMWD's water supply is comprised entirely of groundwater from the Bunker Hill Basin (part of the San Bernardino Basin Area). More information about groundwater basins is included in **Part 1 Chapter 3** of the 2020 IRUWMP.

8.4.1 Purchased or Imported Water

SBMWD does not currently purchase imported SWP water or other supplies for direct use. SBMWD participates in the San Bernardino Basin (SBB) Groundwater Council, which utilizes imported water to recharge the basin.

8.4.2 Groundwater

Groundwater currently supplies the 100% of SBMWD's total supply, and SBMWD will continue to rely on groundwater as its preferred source of supply. SBMWD's production from the Bunker Hill Subbasin (part of SBB) for the past five years is shown in Table 8-8. SBMWD participates in several ongoing water conservation measures and contributes to regional recharge projects through the SBB Groundwater Council to optimize and enhance the use and reliability of local groundwater water resources. Relevant portions of the adjudications and judgments that govern groundwater use are provided in Part 3, Appendix B. Additional discussion of basin rights and management for each basin is included in Part 1, Chapter 3 of the 2020 IRUWMP.



Groundwater recharge at the Waterman Percolation Basins

Table 8-8. DWR 6-1R Groundwater Volume Pumped (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Bunker Hill (part of SBB)	37,276	39,331	38,897	37,840	42,182
	TOTAL	**37,276**	**39,331**	**38,897**	**37,840**	**42,182**

8.4.3 Surface Water

SBMWD currently does not plan to utilize any surface water as a direct source of drinking water.

8.4.4 Stormwater

SBMWD is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the SBB. These regional projects are discussed in **Part 1 Chapter 3**.

8.4.5 Wastewater and Recycled Water

SBMWD operates the sewer collection system within their service area. Collected wastewater from SBMWD, as well as from the County of San Bernardino, City of Loma Linda, and EVWD is treated at the San Bernardino Water Reclamation Plant to a secondary treatment level.

Following treatment at the San Bernardino Water Reclamation Plant, effluent is conveyed to the Rapid Infiltration and Extraction (RIX) facility in the City of Colton for tertiary treatment. This facility is jointly owned by SBMWD and the City of Colton and is operated under contract solely by the SBMWD. At the RIX facility, tertiary treatment to Title 22 standards consists of a native soil filtration process followed by ultraviolet (UV) disinfection prior to discharge to the Santa Ana River.

Table 8-9 and **Table 8-10** show existing wastewater collection and treatment at the San Bernardino Water Reclamation Plant.

> It is estimated that approximately 61% or 12.86 million gallons per day (MGD) of the wastewater collected at the San Bernardino Water Reclamation Plant was generated within SBMWD's water service area in 2020.

8.4.5.1 Potential, Current, and Projected Recycled Water Uses

SBMWD currently does not use recycled water to offset potable demand. SBMWD is planning a recycled water project called the Tertiary Treatment System project, which be a Title-22 compliant tertiary treatment system that will supply recycled water for groundwater recharge in the SBB as well for direct use at the Water Reclamation Plant. Additionally, recycled water is utilized by the region for meeting habitat needs in the Santa Ana River (see **Part 1, Chapter 3.4**).

Table 8-9. DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
City of San Bernardino	Metered	14,415	City of San Bernardino	City of San Bernardino Water Reclamation Plant (WRP)	Yes	No
	TOTAL:	**14,415**				

Table 8-10. DWR 6-3R Wastewater Treatment and Discharge within Service Area in 2020 (AF)

-							2020 VOLUMES				
WASTEWATER TREATMENT PLANT NAME	DISCHARGE LOCATION NAME OR IDENTIFIER	DISCHARGE LOCATION DESCRIPTION	WASTEWATER DISCHARGE ID NUMBER	METHOD OF DISPOSAL	PLANT TREATS WASTEWATER GENERATED OUTSIDE THE SERVICE AREA	TREATMENT LEVEL	WASTEWATER TREATED	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA	INSTREAM FLOW PERMIT REQUIREMENT
San Bernardino Water Reclamation Plant	Rapid Infiltration/Extraction (RIX) Plant	Flow to RIX		Other	Yes	Secondary, Disinfected - 23	23,763	23,763			
						TOTAL:	**23,763**	**23,763**	**-**	**-**	**-**

8.4.6 Water Exchanges and Transfers

SBMWD has water exchange and transfer agreements with several of the surrounding agencies on an as-needed basis. Exchanges occur when SBMWD pumps water for another agency and in turn receives water from that agency at a future time and at a specified ratio to account for pumping and delivery costs. Exchanges in the past have occurred during periods of lowered groundwater levels, loss of water by other agencies due to groundwater contamination, and to facilitate increased pumping in SBMWD's artesian pressure zone to lower groundwater levels that had infiltrated underground utilities. Exchanges are on an as-needed basis and only occur when adequate supplies are available within SBMWD's service area. Therefore, exchanges are not taken into consideration when examining future water supplies

8.4.7 Future Water Projects

As discussed previously, SBMWD is planning a recycled water supply project that will be used to recharge the Bunker Hill Basin and meet non-potable demands at the Water Reclamation Plant.

8.4.8 Summary of Existing and Planned Sources of Water

SBMWD's water supply is comprised entirely of local groundwater. The volume of water utilized pumped in 2020 is summarized in **Table 8-11** and projected supply is summarized in **Table 8-12**.

East Branch of the California Aqueduct & Devil Canyon Power Plant

Table 8-11. DWR 6-8R Actual Water Supplies in 2020 (AF)

-		2020		
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	Bunker Hill (part of SBB)	40,107	Drinking Water	
Groundwater (not desalinated)	Bunker Hill (part of SBB)	2,075	Other Non-Potable Water	
-	**TOTAL:**	**42,182**		**-**

Table 8-12. DWR 6-9R Projected Water Supplies (AF)

		PROJECTED WATER SUPPLY				
		2025	2030	2035	2040	2045
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	Bunker Hill (part of SBB)	42,980	44,371	43,521	42,396	43,514
Recycled Water	Bunker Hill - Recycled Water Recharge	4,472	4,472	6,714	8,956	8,956
Recycled Water	Recycled Water - Direct	1,133	1,133	1,133	1,133	1,133
-	**TOTAL:**	**48,585**	**49,976**	**51,368**	**52,485**	**53,603**

Recycled water recharge supplies shown indicate water that will be extracted from SBB and replaced in-kind with recycled water recharge. Groundwater supplies from SBB are increased to meet the Total Supply Target with 15% Reliability Factor.

Table 8-13. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

-	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	48,585	49,976	51,368	52,485	53,603
Demand Totals From Table 4-3R	42,248	43,458	44,667	45,639	46,661
DIFFERENCE:	**6,337**	**6,519**	**6,700**	**6,846**	**6,992**

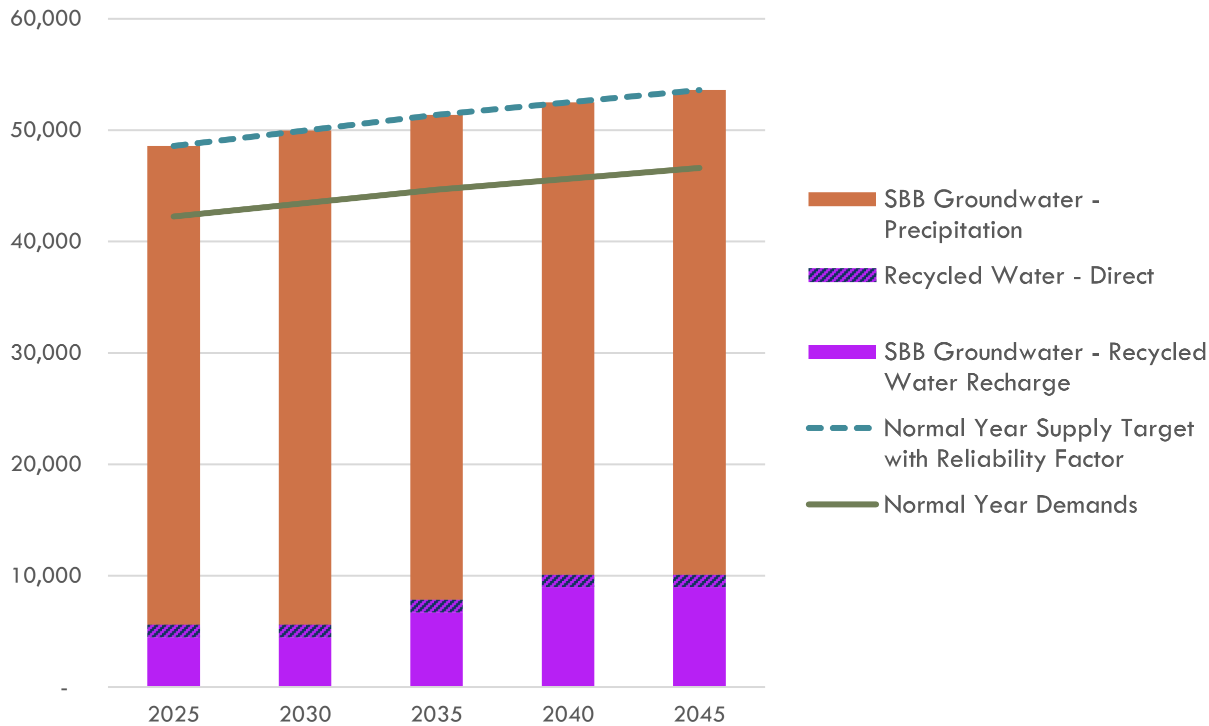


Figure 8-4: SBMWD Projected Supply and Demand Comparison (AF)

8.4.9 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2020, SBMWD consumed 790.6 kWh of energy on water facilities per AF of water delivered.

8.5 Water Service Reliability Assessment

This section considers SBMWD's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from SBMWD's current source of supply through 2045.

8.5.1 Constraints on Water Sources

Based on current conditions, water quality is not expected to affect SBMWD's supply reliability. However, water quality issues are constantly evolving. SBMWD will take action to protect and treat supplies when needed, though water quality treatment is known to have significant costs. These water quality issues are further discussed at a regional level in **Part 1 Chapter 3**.

8.5.2 Year Type Characterization

In general, groundwater is 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 BTAC, monitor groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in **Part 1 Chapter 3**.

Per UWMP requirements, SBMWD has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition 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.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

8.5.3 Water Service Reliability

The results of the reliability assessment are summarized in the tables below.

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. 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% increase throughout the 5-year drought to be conservative.

As described in **Part 1 Chapter 3**, the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. SBMWD is able to pump additional groundwater from Bunker Hill Basin to meet total demands in dry years and participates in efforts to replenish the basins with imported and local water through regional recharge programs. As a result, SBMWD's total groundwater supplies are not reduced in dry years so 2020 is considered the base year for all year types. Based on the analysis, SBMWD does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, SBMWD participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. SBMWD also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 8-14**. The percent of average supply increases in drought years because SBMWD's groundwater production will increase to meet an assumed 10% increase in demands.

Table 8-14. DWR 7-1R Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS AS PERCENT OF AVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a normal year are shown in **Table 8-13**.

The projected supply and demand during a single dry year are shown in **Table 8-15**. SBMWD's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basins SBMWD produces water from have storage for use in dry years so SBMWD can produce the volume of water needed to meet 100% of demands in single dry years. SBMWD's supplies are 100% reliable during single dry years.

Table 8-15. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

-	2025	2030	2035	2040	2045
Supply Totals	53,444	54,974	56,504	57,734	58,963
Demand Totals	46,473	47,803	49,134	50,203	51,272
DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**

The projected supply and demand during five consecutive dry years are shown in Table 8-16. SBMWD's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins SBMWD produces water from have storage for use in dry years so SBMWD can produce the volume of water needed to meet 100% of demands in multiple dry years. SBMWD's supplies are 100% reliable during multiple dry years.

Table 8-16. DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
FIRST YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**
SECOND YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**
THIRD YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**
FOURTH YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**
FIFTH YEAR	Supply Totals	53,444	54,974	56,504	57,734	58,963
	Demand Totals	46,473	47,803	49,134	50,203	51,272
	DIFFERENCE:	**6,971**	**7,171**	**7,370**	**7,530**	**7,691**

8.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because SBMWD relies on groundwater basins with significant storage, available supplies do not vary on a monthly or seasonal basis, so this analysis is conducted on an annual basis. Projected demands and supplies from 2021-2025 are shown in **Table 8-17**.

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. This DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in Section 8.5 and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for SBMWD. SBMWD can produce additional groundwater to meet any increases in demand in dry years. As shown in Part 1 Chapter 5, the region as a whole has sufficient supplies to meet demands plus the 15% Reliability Factor, even in a 5-year drought. As shown in **Part 1 Chapter 5 Figure 5-1**, the SBB had over 4.8 million acre-feet in storage as of 2020 due to regional efforts to store water in wet years for use during dry years.

Although projections in this Plan show that the regional water supplies are sufficient to meet the demands of SBMWD and the Region as a whole, even during a 5-year drought (see **Part 1 Chapter 5**), SBMWD remains committed to water conservation and to being a good steward of regional water resources to preserve supplies for the future due to the possibility of experiencing more severe droughts than anticipated in this Plan.

Table 8-17: Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	47,807
	Total Supplies	54,978
	SURPLUS	**7,171**
2022	Gross Water Use	49,216
	Total Supplies	56,599
	SURPLUS	**7,382**
2023	Gross Water Use	50,625
	Total Supplies	58,219
	SURPLUS	**7,594**
2024	Gross Water Use	52,035
	Total Supplies	59,840
	SURPLUS	**7,805**
2025	Gross Water Use	53,444
	Total Supplies	61,460
	SURPLUS	**8,017**

8.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that SBMWD 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 a number of reasons, such as water supply 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 SBMWD 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 SBMWD maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

> The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. SBMWD's WSCP is attached as Part 4, Appendix H-9.

8.8 Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that SBMWD has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. SBMWD's current per-capita consumption is less than its 2020 compliance target. SBMWD expects to continue to implement current conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

8.8.1 Existing Demand Management Measures

8.8.1.1 Water Waste Prevention Ordinances

SBMWD adopted Rule and Regulation Number 21 (Attachment 1 to Part 4, Appendix H-9), which prohibits the waste of water and adopts water shortage conditions in the form of three stages. There are no available estimates on the conservation savings resulting from this DMM or the effects it may have on SBMWD's ability to further reduce demand.

8.8.1.2 Metering

One hundred percent of SBMWD's retail customers are metered and billed with commodity rates. SBMWD has a meter maintenance and replacement plan. SBMWD encourages the use of dedicated landscape meters during development review and through water rates.

8.8.1.3 Conservation Pricing

One hundred percent of SBMWD's retail customers are metered and billed with commodity rates with conservation tiers established per SBMWD Rule and Regulation 21 (provided as Attachment 1 to Part 4, Appendix H-9).

8.8.1.4 Public Education and Outreach

SBMWD is in compliance with this DMM. The programs are implemented by SBMWD's Water Conservation/Public Affairs Coordinator.

8.8.1.4.1 Public Education Programs

SBMWD holds bi-annual water conservation landscape workshops and conservation presentations to neighborhood associations and community groups upon request. SBMWD also coordinates inspections and notifies customers in an attempt to identify sources of high-consumption, water waste issues, potential leaks, and inefficient irrigation and water use practices.

SBMWD's website includes a webpage dedicated to water conservation (https://www.sbmwd.org/205/Conservation) to promote and educate water use efficiency by offering programs and resources including:

- Multiple ways to report water waste
- Lists of indoor/outdoor conservation tips
- Lists of all conservation rebate programs
- Information regarding end user water use efficiency standards, drought and emergency supply conditions, and updates on state mandated regulations
- Calendar of water saving tips and resources including conservation related community events hosted or sponsored by SBMWD
- Home water audit checklist and walk through instructions
- Information about local water sources, "Where Your Water Comes from"
- Posting of the annual Consumer Confidence Reports
- Contact information of Conservation Coordinator
- Virtual water education video lessons with follow-along activity sheets in English and Spanish.
- School classroom presentations and for grades K-12
- Annual Water Conservation Awareness Poster Contest for students grades K-12

Notifications of local conservation related topics and SBMWD sponsored events are posted on the SBMWD public facing website and social media including Nextdoor, Facebook, Instagram, Twitter, and YouTube. Social media is also used to post information on changes in customer services, service alerts, and promotions for conservation programs and incentives.

8.8.1.4.2 School Education Programs

SBMWD provides elementary and middle school conservation presentations with certified educators for schools within the SBMWD service area. SBMWD partners with the Inland Empire Resource Conservation District to provide conservation and water career presentations to local schools including elementary schools, middle schools, high schools and colleges.

SBMWD sponsors and participates on the Inland Solar Challenge committee. SBMWD hosts an annual water awareness poster contest for local students grades k-12. Instructional resources including videos and presentations are also offered to schools participating in the poster contest.

SBMWD distributes an annual calendar which features the winners of the Water Conservation Awareness Poster Contest and also includes the following resources:

- Conservation incentive information
- Conservation staff contact information
- Tips for efficient indoor/outdoor water use

8.8.1.5 Programs to Assess and Manage Distribution System Real

SBMWD operates a meter replacement program which includes replacing meters on a 19-year rotation. Source meters are tested annually. About half of the system has older water mains which the City is aggressively replacing. Additionally, SBMWD operates a leak detection program. To achieve full compliance with the DMM, SBMWD will perform a water loss audit using the AWWA Manual 36. SBMWD will determine the economic value of recovering the water loss, based on the avoided cost of water. SBMWD will perform an analysis of components of apparent and real losses identified per AWWA Manual 36 model, and will determine actions to reduce loss where cost-effective. A comparison of the year-to-year trend of nonrevenue water will be used to evaluate the effectiveness of this DMM. If SBMWD were to reduce nonrevenue water by even one percent this would result in a water savings of 500 AF or more each year. Continued implementation of water loss control practices and procedures is not anticipated to have an effect on SBMWD's ability to further reduce demand.

8.8.1.6 Water Conservation Program Coordination and Staffing Support

To be in compliance with this DMM, SBMWD designated a full time water conservation coordinator in 2015. There are no available estimates on the conservation savings resulting from the DMM or the effects of this DMM on SBMWD's ability to further reduce demand.

8.8.1.7 Other Demand Management Measures

SBMWD offers several indoor and outdoor water conservation rebate programs to promote water use efficiency. Each SBMWD residential account holder is eligible for up to $2,000 in water conservation rebates. CII and Multi-family properties are also eligible for rebates on a project by project basis. SBMWD annually budgets approximately $100,000 for both residential and CII rebate programs. Conservation programs and incentives can be found on the Department's website at **https://www.sbmwd.org/205/Conservation** and **https://www.sbmwd.org/249/Rebate-Information**.

8.8.1.7.1 Irrigation Controller Rebate

Customers can get up to a $250 rebate for installing a weather-based controller or $100 for a standard controller.

8.8.1.7.2 High-Efficiency Sprinkler Nozzle Rebate

Customers can qualify for a 50-percent rebate, up to $200, for installing High-Efficiency sprinkler heads.

8.8.1.7.3 Garden Hose Shut-Off Nozzle Rebate

Customers who purchase up to 2 automatic shut-off nozzles for their garden hoses can receive a rebate of up to $10.

8.8.1.7.4 Drip Irrigation System Rebate

Customers purchasing and installing a drip system in their landscaping or garden may qualify for a 50% rebate, up to $150.

8.8.1.7.5 Drought Tolerant Plant Rebate

Customers who incorporate drought tolerant trees, plants, and shrubs into their landscaping can receive a 50% rebate, up to $300.

8.8.1.7.6 Turf Replacement / Removal Rebates

Customers who replace grass turf with mulch or gravel can receive up to a 50% rebate, up to $300. Customers who replace grass turf with artificial turf can receive up to $2 per square foot, up to $400. Customers who replace grass turf with other approved materials can receive a rebate of $2 per square foot, up to $2,000.

8.8.1.7.7 High-Efficiency Toilet Rebate

Customers can get a rebate of up to $100 when they purchase and install high-efficiency toilets that use 1.28 gallons per flush or less (dual flush toilets that use more than this for any flush, do not qualify). These high-efficiency water-saving toilets can be purchased at nearly any hardware or home improvement store. SBMWD is offering up to four toilet rebates per residence.

8.8.1.7.8 High-Efficiency Showerhead Rebate

Customers are eligible for a $20 rebate for the purchase and installation of a low flow shower head. These shower heads use 1.6 gallons per minute or less. Maximum of four per residence.

8.8.1.7.9 High-Efficiency Washing Machine Rebate

SBMWD offers customers a $100 rebate for the purchase and installation of a high-efficiency washing machine that has a CEE rating of Tier 1 or greater. Limit one per residence.

8.8.1.7.10 High-Efficiency Dishwasher Rebate

Customers are eligible for a $75 rebate for the purchase and installation of a single high-efficiency dishwasher that has a CEE Rating of Tier 1 or greater. Limit one per residence.

8.8.1.7.11 Household Conservation Kits

SBMWD has put together a household conservation kit to assist their residential water customers. In this packet customers get an easy-to-install kitchen aerator, two bathroom aerators, a shower timer, and two leak detecting dye tabs. By installing these simple items, customers can see substantial water savings over time. The kit is free, but supplies are limited and offered on a first come first serve basis (limit of 1 per household). Kits can be picked up at SBMWD offices at 1350 S. “E” Street, San Bernardino, CA 92408. The customer’s name must appear on an SBMWD residential account. These kits are available only while supplies last.

8.9 Adoption, Submittal and Implementation

This section describes SBMWD's process for adopting, submitting, and implementing the 2020 IRUWMP and SBMWD's WSCP.

8.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to SBMWD's public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within SBMWD's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

SBMWD provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in Part 4, Appendix H-2.

8.9.2 Public Hearing and Adoption

SBMWD held a public hearing on June 22, 2021 to hear public comment and consider adopting this 2020 IRUWMP and SBMWD's WSCP.

As part of the public hearing, the SBMWD provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed SBMWD the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

SBMWD's adoption resolution for the 2020 IRUWMP and SBMWD's WSCP is included in Part 4, Appendix H-3.

8.9.3 Plan Submittal

SBMWD will submit the 2020 IRUWMP and SBMWD's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption. 2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

8.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, SBMWD will make the plan available for public review during normal business hours by placing a copy of the 2020

IRUWMP and SBMWD's WSCP at the front desk of the City's office, and by posting the plans on the City's website for public viewing.

8.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or SBMWD's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

SOUTH MESA WATER COMPANY

2020 IRUWMP

Part 2 Chapter 9

SMWC 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

9

RETAIL URBAN WATER MANAGEMENT PLAN

South Mesa Water Company

This chapter describes information specific to the South Mesa Water Company, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the South Mesa Water Company's reporting requirements for 2020 under the UWMP Act[1].

9.1 System Description

South Mesa Water Company (SMWC) is a mutual water company, which was established in 1912 as a successor to the earliest land and water companies in the area dating back to 19th Century. SMWC provides domestic and irrigation water service to its shareholders within its service territory, which comprises a portion of the City of Yucaipa in San Bernardino County and a portion of the City of Calimesa in Riverside County. SMWC currently supplies water to just under 3,000 water service connections but anticipates exceeding that level in the very near future. SMWC's water supply includes locally produced groundwater from the Yucaipa Sub-basin (DWR 8-02.07), and also groundwater produced from the adjacent adjudicated portion of the San Timoteo Sub-basin (DWR 8-02.08) in accordance with SMWC's adjudicated water rights.

IN THIS SECTION

- System Description
- Water Use and SBX7-7 Compliance
- Water Supply
- Water Service Reliability and Drought Risk Assessment
- Water Shortage Contingency Plan Summary
- Demand Management Measures
- Adoption, Submittal, and Implementation

[1] This chapter was prepared by SMWC and its consultant, Land Engineering Consultants, Inc.

The service area is approximately 50% built-out with ongoing developments under construction or being approved by the planning departments of the governing agencies. The majority of the population in the service area is from the City of Yucaipa at 55% and City of Calimesa at 45%.

The SMWC service area consists of various land uses, while the majority of the current use is single-family and multi-family residential. Within the near future, the area anticipates growth in industrial and commercial development, as well as, continued growth in residential development.

SMWC's primary water uses go toward single-family and multi-family households within many lower income communities. Water is currently obtained entirely by pumping from local groundwater sources; however, additional sources can easily made available to SMWC if needed. SMWC has plans in development to improve the water system capabilities in order to keep up with future needs and requirements. Water shortage and disaster concerns have been mitigated through the development of a Water Shortage Contingency Plan, Emergency Response Plan, and additional emergency preparedness facilities and procedures.

SMWC's service area is shown in **Figure 9-1**.

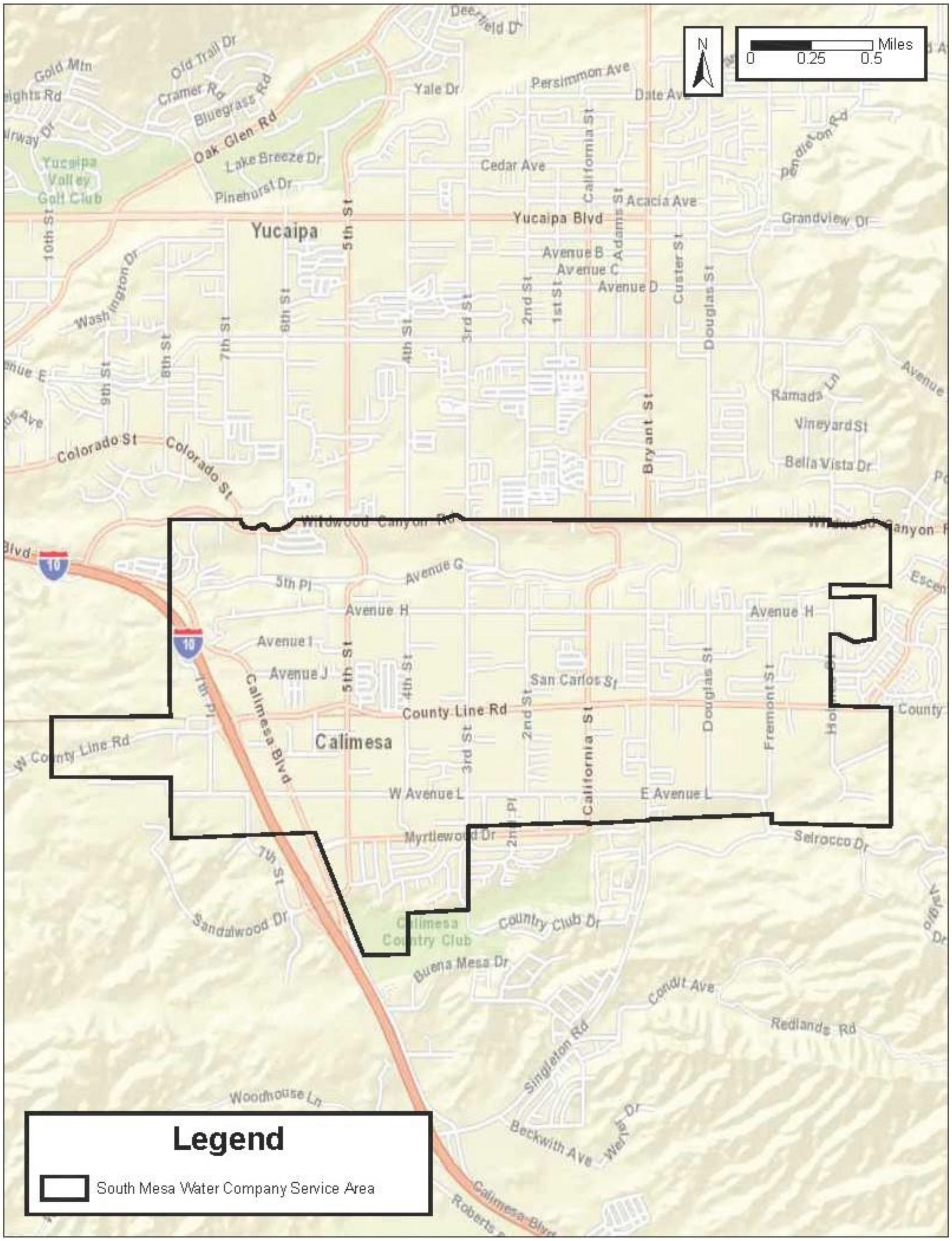


Figure 9-1: South Mesa Water Company Service Area Map

**Certain boundaries of SMWC's service area are presently a subject of litigation in the matter, captioned: Yucaipa Valley Water District v. South Mesa Water Company, San Bernardino Superior Court Case No: CIVDS2009681.*

The regional climate, which includes SMWC's service area, is described in **Part 1, Chapter 2** of the 2020 IRUWMP.

9.1.1 Population

The following gives a brief explanation for each of the components used to calculate the anticipated population growth rate within SMWC's service area:

City of Yucaipa Population Data – The city's web portal indicates the following:

"With a population of 51,376 as of the 2010 Census, Yucaipa is the 16th most populous of the 24 cities in San Bernardino County. Yucaipa has had relatively steady population growth. From 1950 to 1970, Yucaipa increased by about 5,500 residents each decade. Population growth accelerated to about 9,000 residents per decade for the next 30 years. The largest increase was between 2000 and 2010, when Yucaipa's population increased 25 percent due to the real estate boom and building of new subdivisions. Looking forward, Yucaipa is expected to build out to a population of 75,000 residents".

> Based upon the published indicated above, together with those reported of 41,207 in year 2000, 51,376 in year 2010, and about 53,100 in year 2014, for purposes of this estimate SMWC will use a base population amount of 53,531 in base year 2015.

City of Calimesa Population Data – The city's web portal indicates the following:

"The population at the time of incorporation, according to the 1990 Census, was 6,659. Growth over the next 20 years was slow: the 2010 Census showed a population of 7,879, an average growth rate of just 61 persons each year. A majority of the future growth expected to occur over the next 22 years will likely be accommodated in the adopted specific plan areas."

> Based upon the published population data and projections indicated above, for purposes of this estimate SMWC will use a base population amount of 8,184 in base year 2015.

Southern California Region (RTP/SCS) – This Regional Growth Forecast (RTP/SCS) provides for known growth measured to year 2012, with projections for growth from year 2016 through year 2040 as described below:

"Regional Growth Forecast: Southern California Associated Governments (SCAG) projects that the region will add 3.8 million residents, 1.5 million households, and 2.4 million jobs over the RTP/SCS planning horizon (2012-2040). Population and households are projected to grow at the annual average growth rate of 0.7% during the same period, while employment grows faster at 2 percent until 2020, and then stabilizes at 0.7 percent. The SCAG region's population is projected to grow slower than that of the previous years. The slow growth pattern is not present

only in the SCAG region, but is also observed from US and California population projections by US Census Bureau and California DOF, respectively. The slow population growth pattern experienced in the post-recession period is expected to continue into the future. Between 2015 and 2040, the annual population growth rate will be only 0.7 percent, which is similar to the post-recession period, but much lower than that experienced between 2000-2010. The region will grow mainly through natural increase. Nearly nine-tenths of the population growth will be due to natural increase (e.g., births minus deaths) in the region rather than net migration (e.g., in-migration minus out-migration)."

South Mesa Water Company Territory Land Use – For base year 2015, SMWC studied its land uses within its four (4) water pressure zones. The review identified a total of 4,068 residential units consisting of 2,881 single family homes and 1,283 mobile homes / senior units. Of the 1,283 units, 368 reside in all age parks. Using the total number of units indicated above and applying the most current U.S. Census Bureau data from year 2010 of 2.36 persons per household, the base population computes to approximately 9,600 persons within SMWC as of the base year 2015. For purposes of estimating the population growth forward, SMWC uses the Regional Growth Forecast (RTP/SCS) of 0.7% per year. Please note that commercial, industrial and institutional development is not made part of the population estimate, and that anticipated increases in water demand associated with buildout, including residential, commercial, industrial and institutional development, are evaluated in accordance with applicable land use designations and regional growth forecasts and buildout as discussed above. These growth rates were used to estimate future population in the service area; these values are shown in **Table 9-1.**

Table 9-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
Total	9,941	10,294	10,659	11,037	11,429	11,835

9.2 Water Use

This section describes the current and projected water uses within SMWC's service area. SMWC serves potable water only at this time.

9.2.1 Water Use by Sector

SMWC categorizes customers as residential, multi-family, commercial, landscape irrigation and industrial. Water deliveries for each customer class for the years 2016 through 2020 are shown in **Table 9-2.**

Table 9-2: SMWC 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	2,548	2,560	2,565	2,568	2,573
Multi-Family	223	231	239	240	241
Commercial	144	143	141	142	145
Landscape	19	20	20	18	19
Industrial	1	1	1	1	1
Total	**2,935**	**2,955**	**2,966**	**2,969**	**2,979**

9.2.1.1 Past Water Use

SMWC's water use by customer class from 2016-2020 is shown in **Table 9-3** and water consumption by customer class in the last five years is shown in **Figure 9-2.** Approximately 61% of SMWC's deliveries were to single family residential connections, followed by 18% to multi-family connections, 11% to commercial connections, 3% to landscape connections, less than 1% to industrial, and the remainder is shown as water losses.

Table 9-3: 2016-2020 Actual Water Use (AFY)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Residential	1404	1478	1353	1197	1387
Multi-Family	336	327	608	366	349
Commercial	258	270	253	214	242
Landscape (School/Park)	66	61	59	56	108
Industrial	1	2	1	1	1
Water Losses	151	239	91	184	183
Total	**2216**	**2377**	**2365**	**2018**	**2270**

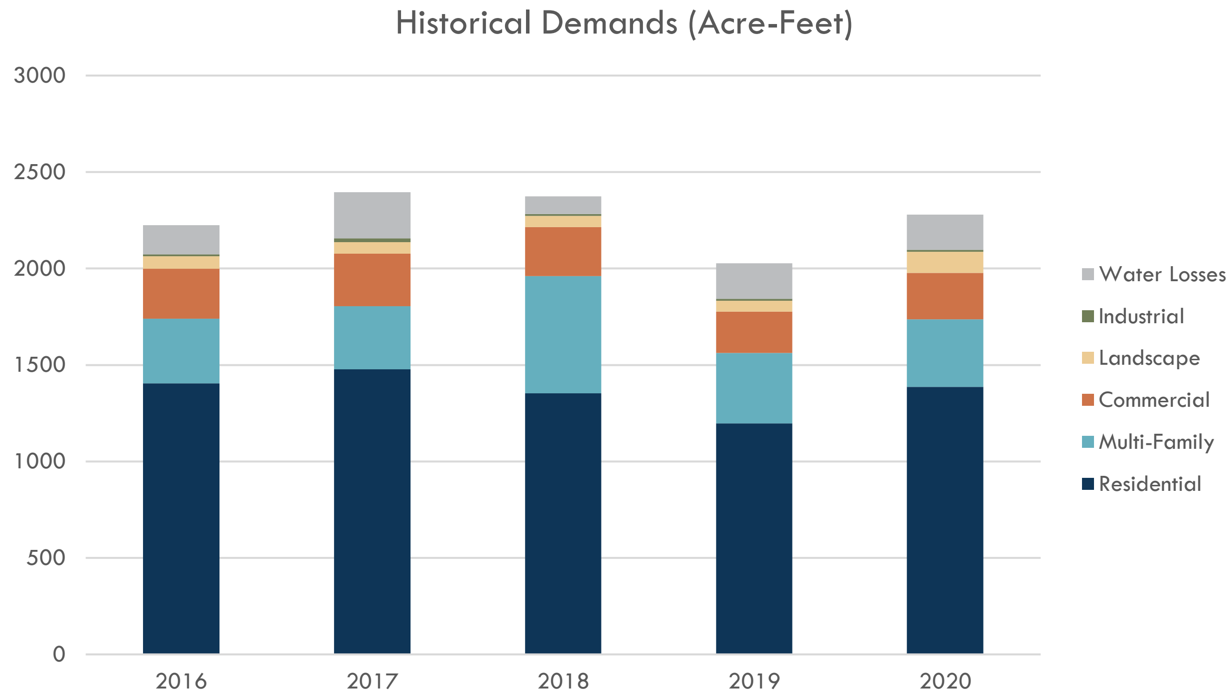


Figure 9-2: SMWC 2016-2020 Water Consumption by Customer Class

9.2.1.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water.

Sources of water loss for water systems generally include:

- **Leaks from water lines** - Leakage from water pipes is a common occurrence in water systems. Small water leaks typically remain undetected for long periods of time but can contribute to the overall water loss. Aging pipes typically have more leaks.
- **Water used for flushing and fire hydrant operations**
- **Unauthorized uses or theft of water**
- **Customer Meter Inaccuracies** - Customer meters can under-represent actual consumption in the water system.

SMWC has not previously prepared an annual AWWA Water Audit because it did not meet the definition of an Urban Water Supplier. As SMWC is now serving nearly 3,000 connections, they will complete an AWWA Water Audit for upcoming years, once required, in accordance with reporting requirements to the State. Water loss is estimated based on the difference between production and consumption from 2016 to 2020, these values are shown in **Table 9-4.**

Table 9-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		VOLUME OF WATER LOSS*
MM	YYYY	
1	2016	151
1	2017	239
1	2018	91
1	2019	184
1	2020	183

1. Water loss is estimated based on the difference between production and consumption.

In the past 5 years, SMWC's water loss has ranged from 4% - 11% of water sales. SMWC is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standard that is being developed by the State Water Board. SMWC's programs to manage water loss are described in **Section 9.8.1.5**. These programs will increase the efficiency of the water distribution system by decreasing future water losses; however, water losses cannot be prevented entirely.

9.2.2 Projected Water Use

SMWC's customer metered use of 2,270-acre feet for calendar year 2020 has been used as a baseline for projections. To project metered use beyond 2020, SMWC is using the projected population growth rate of 0.7% per year, or 3.5% per 5-year period, and an additional estimated water use growth rate of 0.3% per year, or 1.5% per 5-year period has been added for commercial, industrial and institutional developments for a total of 5.0% increase in water use per 5-year period.

This growth rate is applied to each customer type, then all of the category results are added to estimate the total future water use. Projected future demands by customer class as well as estimated losses are presented in **Table 9-5**, **Table 9-6,** and **Figure 9-3.**

Table 9-5: DWR 4-2R Projected Demands for Water (AF)

- USE TYPE	ADDITIONAL DESCRIPTION	PROJECTED WATER USE 2025	2030	2035	2040	2045
Residential		1,456	1,529	1,606	1,686	1,770
Multi-Family		366	385	404	424	445
Commercial		254	267	280	294	309
Landscape	schools/parks	113	119	125	131	138
Industrial		1	1	1	1	1
Water Losses		188	198	208	218	229
	Total:	**2,380**	**2,499**	**2,624**	**2,755**	**2,893**

Table 9-6: DWR 4-3R Total Gross Water Use (AF)

-	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	2,270	2,380	2,499	2,624	2,755	2,893
Recycled Water Demand* From Table 9-4R	-	-	-	-	-	-
Total Water Use:	**2,270**	**2,380**	**2,499**	**2,624**	**2,755**	**2,893**

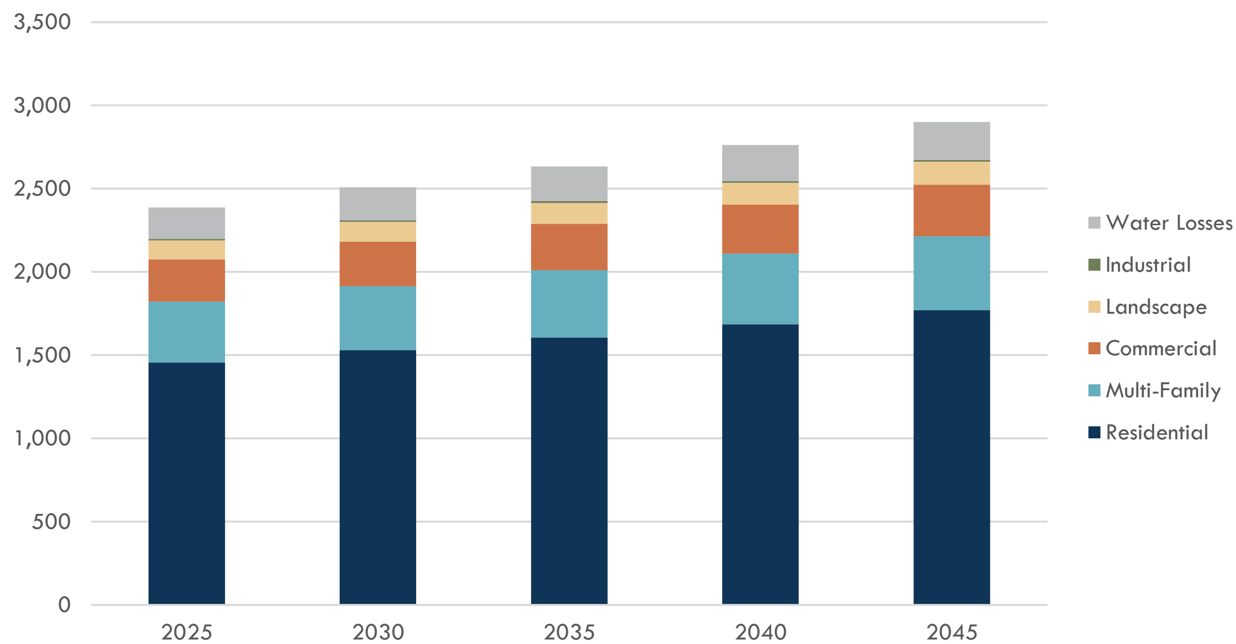


Figure 9-3: SMWC Projected Future Water Consumption by Customer Class

9.2.2.1 Estimating Future Water Savings

SMWC has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of SMWC's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, SMWC will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. The SMWC is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

9.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires water use projections in an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. The SMWC service area contains the lower income portions of the Cities of Calimesa and Yucaipa. It has been estimated that approximately 58% of projected demand goes to lower income households.

In the Spring of 2020, the State Water Resources Control Board indicated to SMWC that it did not qualify as a disadvantaged community for purposes of grant funding that is specially earmarked for DACs. Upon review of the census tracts that the SWRCB had reviewed regarding SMWC, it was noticed that two of the census tracts in the SMWC service area did not contain any data. SMWC then asked that an income survey be performed to get a better understanding of the economic status of the residents. The income survey as performed over a several month period by Kennedy Communications, Inc. entailed sending out an informational mailing from SMWC letting the residents know why the income survey was necessary. After the initial mailing, Kennedy Communications, Inc. sent out a letter, accompanied by the survey, describing the projects that SMWC wanted to build which would improve water reliability. The residents responded overwhelmingly. After scrubbing the data for duplicates or surveys which were incomplete, the Median Household Income (MHI) was determined to be $34,299 which qualified it as a severely disadvantaged community. SMWC is now recognized by the state of California as serving a community, having a MHI of 60% of the entire state.

9.2.4 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

9.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets SMWC developed and demonstrates that compliance by 2020 was achieved.

Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for SMWC's calculations are included in **Part 4, Appendix I-7.**

9.3.1 Baseline and Target

For the period from 2001 to 2010, the average base daily capita water use is 281 GPCD SMWC's calculated water use target for 2020 is 225 GPCD.

Table 9-7: DWR 5-1R Baselines and Targets Summary

BASELINE PERIOD	START YEAR	END YEAR	AVERAGE BASELINE GPCD	CONFIRMED 2020 TARGET
10-15 year	2001	2010	281	225
5 year	2006	2010	263	

9.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, SMWC has met its Confirmed Water use Target for 2020 of 225 GPCD, as shown in **Table 9-8.** To maintain this level of water use, SMWC intends to continue its current level of outreach and programs for the foreseeable future.

Table 9-8: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
225	204	Yes

9.4 Water Supply

SMWC's water supply is comprised entirely of local groundwater.

9.4.1 Purchased or Imported Water

SMWC does not currently purchase imported SWP water or other supplies but is in the planning stages of obtaining rights to a recharge basin that would utilize SWP water.

9.4.2 Groundwater

SMWC produces groundwater from two different groundwater basins: the Yucaipa Sub-basin (DWR 8-02.07), and the adjudicated portion of the San Timoteo Sub-basin (DWR 8-02.08), known as the Beaumont Groundwater Basin. SMWC production wells draw water from two subareas often referred to as “sub-basins” within the Yucaipa Sub-basin: the Calimesa sub-basin and the Live Oak sub-basin. Detailed discussions of each groundwater basin and sub-basin, water rights and management are included in **Part 1, Chapter 3.**

SMWC currently has 8 active groundwater production wells. SMWC Wells 9, 11, 12, 16 and 17 extract drinking water from the Calimesa sub-area of the Yucaipa sub-basin. SMWC Wells 5 and 7, extract water from the Live Oak sub-area of the Yucaipa sub-basin. SMWC Well 4 extracts water from the adjudicated Beaumont Groundwater Basin.

SMWC has a storage account within the Beaumont Groundwater Basin which contains a water supply in the amount of approximately 10,000 AF.

SMWC’s historical groundwater production for the past five years is shown in **Table 9-9.**

Table 9-9:DWR 6-1R Groundwater Pumped Last Five Years (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Yucaipa Sub-basin (DWR 8-02.07)	1,863	2,009	2,001	1,718	2,041
Alluvial Basin	San Timoteo Sub-basin (DWR 8-02.08) (Beaumont Groundwater Basin)	353	368	365	300	229
	Total:	**2,216**	**2,377**	**2,366**	**2,018**	**2,270**

9.4.3 Surface Water

SMWC currently has no plans for future use of surface water supplies. SMWC is in the planning stages of developing recharge sites to accommodate supplemental water for storage in the future.

9.4.4 Stormwater

SMWC is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the basins SMWC produces water from. These regional projects are discussed in **Part 1 Chapter 3.**

9.4.5 Wastewater and Recycled Water

Yucaipa Valley Water District (YVWD) provides wastewater collection and treatment for the area in which SMWC serves water.

The Henry N. Wochholz wastewater treatment plant, as described by YVWD in the 2015 UWMP, includes the following major components:

Septage receiving station, headworks grit removal system, primary equalization tank, secondary treatment system, advanced tertiary treatment facilities, reverse osmosis, recycled water storage reservoir. Wastewater is conveyed to the plant through 120 miles of gravity sewer pipeline and five pump stations.

Information about wastewater collected and treated is presented in **Table 9-10.**

9.4.5.1 Potential, Current, and Projected Recycled Water Uses

SMWC does not currently serve recycled water to its customers, but it has developed plans to do so including through coordination with other water agencies.

Table 9-10: DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
Yucaipa Valley Water District	Estimated	835	Yucaipa Valley Water District	Henry N. Wochholz WWTP	No	No
-	**Total:**	**835**				

9.4.6 Water Exchanges and Transfers

SMWC does not anticipate in regular or long-term transfers or exchanges, during the period covered by this Plan. Any transfer or exchanges would be as-needed related to an emergency.

9.4.6.1 Emergency Interties

SMWC has an "Emergency Inter-Tie" with YVWD.

Emergency Inter-Ties: Yucaipa Valley Water District - 1,000 to 1,500 gpm

To date, SMWC has not received any water from the inter-tie but has delivered water to YVWD.

9.4.7 Future Water Projects

SMWC is currently in planning and engineering stages with several projects, those being area wide water line infrastructure replacement, booster station replacement, and forward planning for upcoming capacity increases through new reservoir construction. These projects vary throughout the service area and are in various stages of planning and pre-construction. Notably and pending state funding, SMWC has developed plans to upgrade major transmission and distribution lines through a significant portion of County Line Road.

SMWC also has plans to utilize the state water project to convey water to planned recharge basin facilities, develop additional groundwater wells, recharge basins, and system wide line replacements to increase the available water supplies.

9.4.8 Summary of Existing and Planned Sources of Water

SMWC's water supply is comprised entirely of local groundwater and will continue to be for this plan period.

As discussed in **Part 1 Chapter 5**, SMWC is applying a Reliability Factor of 15% to its supply reliability analysis to account for uncertainties in supply and demand projections. The 15% value is recommended in a study by the RAND Corporation that evaluated uncertainty factors in the regional supplies and demands, including population growth, per capita water use, climate change impacts on supplies and demands, SWP project supplies and local surface water supplies. See **Part 1 Chapter 5** for more details on how the Reliability Factor was established.

For the purposes of normal year supply projections in this 2020 IRUWMP, SMWC is using the 15% Reliability Factor to establish a supply target of 15% more than total projected demand.

The volume of water utilized from each source in 2020 is summarized in **Table 9-11** and projected supply by source is summarized in **Table 9-12.**

Table 9-11. DWR 6-8R Actual Water Supplies in 2020 (AF)

-		2020		
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	Actual Volume	Water Quality	Total Right or Safe Yield
Groundwater (not desalinated)	Yucaipa Sub-basin (DWR 8-02.04)	2,041	Drinking Water	See Note
Groundwater (not desalinated)	San Timoteo Sub-basin (DWR 8-02.08) (Beaumont Groundwater Basin	229	Drinking Water	See Note
-	**Total:**	**2,270**		

See Part 1 Chapter 3 for discussion of Rights and Safe Yield

Table 9-12. DWR 6-9R Projected Water Supplies (AF)

		PROJECTED WATER SUPPLY				
		2025	2030	2035	2040	2045
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	Yucaipa Sub-basin	2,409	2,528	2,656	2,788	2,928
Groundwater (not desalinated)	San Timoteo Sub-basin (DWR 8-02.08) (Beaumont Groundwater Basin)	328	345	362	380	399
	Total:	**2,737**	**2,873**	**3,018**	**3,168**	**3,327**

Supplies shown in this table are planned pumping, increased to meet the Total Supply Target with 15% Reliability Factor.

9.4.9 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.

In 2020, SMWC consumed a total of 3,099,139 kWh of energy for water facilities.

9.5 Water Service Reliability Assessment

This section considers SMWC's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from SMWC's current source of supply through 2045.

9.5.1 Constraints on Water Sources

Based on current conditions, water quality is not expected to affect SMWC's supply reliability. However, water quality issues are constantly evolving. SMWC will take action to protect and treat supplies when needed through water quality treatment. These water quality issues are further discussed at a regional level in **Part 1 Chapter 3.**

9.5.2 Year Type Characterization

In general, groundwater is less vulnerable to seasonal and climatic changes than surface water (i.e. local and imported) supplies. The Yucaipa Groundwater Sustainability Agency and the Beaumont Groundwater Basin Watermaster monitor groundwater levels of the local groundwater sources to maintain long term sustainability of the basins. Further discussion of regional water resource management and challenges is included in **Part 1, Chapter 3.**

Per UWMP requirements, SMWC has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition 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.

- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

9.5.3 Water Service Reliability

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. 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% increase throughout the 5-year drought to be conservative.

As described in **Part 1, Chapter 3**, the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. Even though localized drought conditions should not affect supply, SMWC participates in several ongoing water conservation measures to optimize and enhance the use and reliability of regional water resources. SMWC also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 9-13.** The percent of average supply increases in drought years because SMWC's groundwater production will increase to meet an assumed increase in demands.

Table 9-13. DWR 7-1R Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS AS PERCENT OF AVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a normal year are shown in **Table 9-14.**

Table 9-14. DWR 7-2R Normal Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	2,737	2,873	3,018	3,168	3,327
Demand Totals From Table 4-3R	2,380	2,499	2,624	2,755	2,893
Difference:	**357**	**374**	**394**	**413**	**434**

The projected supply and demand during a single dry year are shown in **Table 9-15.** SMWC's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basins SMWC produces water from have storage for use in dry years so SMWC can produce the volume of water needed to meet 100% of demands in single dry years. SMWC's supplies are 100% reliable during single dry years.

Table 9-15: DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

	2025	2030	2035	2040	2045
Supply Totals	2,618	2,749	2,886	3,031	3,182
Demand Totals	2,618	2,749	2,886	3,031	3,182
Difference:	**0**	**0**	**0**	**0**	**0**

The projected supply and demand during five consecutive dry years are shown in **Table 9-16**. SMWC's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins SMWC produces water from have storage for use in dry years so SMWC can produce the volume of water needed to meet 100% of demands in single dry years. SMWC's supplies are 100% reliable during multiple dry years.

Table 9-16: DWR 7-4R Multiple Dry Years Supply and Demand Comparison (AF)

		2025	2030	2035	2040	2045
FIRST YEAR	Supply Totals	2,618	2,749	2,886	3,031	3,182
	Demand Totals	2,618	2,749	2,886	3,031	3,182
	Difference:	0	0	0	0	0
SECOND YEAR	Supply Totals	2,618	2,749	2,886	3,031	3,182
	Demand Totals	2,618	2,749	2,886	3,031	3,182
	Difference:	0	0	0	0	0
THIRD YEAR	Supply Totals	2,618	2,749	2,886	3,031	3,182
	Demand Totals	2,618	2,749	2,886	3,031	3,182
	Difference:	0	0	0	0	0
FOURTH YEAR	Supply Totals	2,618	2,749	2,886	3,031	3,182
	Demand Totals	2,618	2,749	2,886	3,031	3,182
	Difference:	0	0	0	0	0
FIFTH YEAR	Supply Totals	2,618	2,749	2,886	3,031	3,182
	Demand Totals	2,618	2,749	2,886	3,031	3,182
	Difference:	0	0	0	0	0

9.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because SMWC relies on groundwater basins with significant storage, available supplies do not vary on a monthly or seasonal basis, so this analysis is conducted on an annual basis.

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. As discussed in the Water Service Reliability Assessment, SMWC can produce additional groundwater to meet any increases in demand in dry years.

Table 9-17: DWR 7-5 Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	2,497
	Total Supplies	2,497
	Surplus/Shortfall without WSCP Action	**0**
2022	Gross Water Use	2,527
	Total Supplies	2,527
	Surplus/Shortfall without WSCP Action	**0**
2023	Gross Water Use	2,557
	Total Supplies	2,557
	Surplus/Shortfall without WSCP Action	**0**
2024	Gross Water Use	2,588
	Total Supplies	2,588
	Surplus/Shortfall without WSCP Action	**0**
2025	Gross Water Use	2,618
	Total Supplies	2,618
	Surplus/Shortfall without WSCP Action	**0**

9.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that SMWC has prepared to 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 a number of reasons, such as water supply 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 SMWC 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 SMWC maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. SMWC's WSCP is attached as Part 4 Appendix I-9.

9.8 Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that SMWC has implemented for the past five years, is currently implementing, and plans to implement in order to promote efficient water use. SMWC's current per-capita consumption is less than its 2020 compliance target. SMWC expects to continue to implement current conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

9.8.1 Existing Demand Management Measures

9.8.1.1 Water Waste Prevention Ordinances

SMWC has adopted a water shortage contingency plan that has a water waste prohibition. SMWC has initiated an aggressive water commodity tiered rate structure to discourage water wasting, if the 20% reduction in per capita use is not met. Large water users have been identified and a program for water conservation is initiated when water waste occurs.

9.8.1.2 Metering

In 2012, SMWC replaced all of its meters with automated meter readers (AMR). SMWC monitors all meters on a monthly basis and replaces or repairs those meters that appear to be malfunctioning or defective.

9.8.1.3 Conservation Pricing

In the fall of 2019, SMWC concluded a six-month review of their rate structure, in response to Senate Bill 998. Starting January 1, 2020 and continuing annually until January 1, 2024, rates will be adjusted to ensure SMWC remains financially stable heading into the future. **Table 9-18** shows the current expected rates for the years 2020 through 2024. SMWC reminds customers that they can control their bill through conservation and reducing non-essential water usage.

Table 9-18. Domestic Water Rates for SMWC 2020 to 2024

METER SIZE	2020	2021	2022	2023	2024
5/8"	$13.09	$14.20	$15.40	$16.71	$18.13
1"	$31.29	$33.95	$36.84	$39.97	$43.37
1.5"	$61.64	$66.88	$72.57	$78.74	$85.43
2"	$98.06	$106.39	$115.44	$125.25	$135.89
3"	$213.37	$231.51	$251.19	$272.54	$295.70
4"	$383.30	$415.88	$451.23	$489.58	$531.20
6"	$789.92	$859.07	$929.92	$1,008.96	$1,094.72

TIER	UNITS PER SHARE OF STOCK*
1	1 – 14.5 units
2	14.6 – 20 units
3	21+ units

*1 unit equals 100 cubic feet or 748 gallons of water

TIER	2020	2021	2022	2023	2024
1	$1.20	$1.31	$1.42	$1.54	$1.67
2	$2.52	$2.73	$2.96	$3.22	$3.49
3	$3.09	$3.36	$3.64	$3.95	$4.29

The water rate structure is designed as an increasing charge for water as usage increases. Water meter readings are done monthly. By adjusting the tier allotments and tier rates, SMWC has the ability to significantly increase water conservation.

This rate structure, along with the other SMWC programs, is planned to greatly reduce the water running down gutters and other water wasting habits.

9.8.1.4 Public Education and Outreach

SMWC goes to great efforts to build upon their relationship with each of their shareholders. They utilize regular website updates and frequent mailers to shareholders to ensure they well-informed and in-touch. Some of the information available in the southmesawater.com website include:

- The "South Mesa Water Company Strategic Plan – 2021-2026"
- Information and tips about finding leaks, determining the cause of high bills, and addressing water pressure issues.
- Water rates, future water rates and construction meter rates.
- Lists of wasteful water actions which are prohibited, and SMWC issues warnings and fines to identified water wasters.
- Water conservation reminders
- SMWC Consumer Confidence Report

Each year, on the 4th Tuesday of February, the annual shareholders' meeting is held. The purpose of the meeting is to elect a board of directors for the coming year and for such other business as may properly come before the meeting. All shareholders are urged to attend. A 20% representation is required to have a quorum in order to conduct business and hold an election. Meeting notices and proxies are mailed to shareholders on February 1st each year.

9.8.1.5 Programs to Assess and Manage Distribution System Real

SMWC has already replaced all the water meters with automated meters to help detect both meter leaks and leaks within the customer's property. During the regular reading duties, the meter and joining pipelines are reviewed for water leakage. Where water is noted in the reading of the meter, a service technician is dispatched to the location of the possible leak to evaluate the situation. Any leaks found, whatever the size, are repaired immediately.

Meters that are noticeably not providing proper readings during the reading period and in the calculations for water used as compared to historic usage by water billing personnel will be evaluated and replaced or repaired as the situation requires.

9.8.1.6 Water Conservation Program Coordination and Staffing Support

SMWC has Supervisory Control and Data Acquisition System (SCADA) system which is utilized to control and monitor all wells, pumps, and reservoirs. Much of this system was upgraded and/or replaced in 2012 as a part of SMWC's system wide rehabilitation. This system is managed by SMWC staff in an effort to coordinate water conservation and keep records of the water system.

9.8.1.7 Other Demand Management Measures

SMWC has few large landscape irrigation areas within its service area. SMWC has met with large landscape owners, and has initiated an informal program for water conservation. SMWC does not have a formal landscape conservation program or incentives, and does not plan to implement this type of program in the near future, but will continue to monitor the large landscape projects for cooperation in conservation.

SMWC does not currently have programs involving residential retrofits, large landscaping conservation programs and incentives, conservation programs for commercial, industrial, and institutional accounts, wholesale agency programs, water waste prohibition, or residential ultra-low flush toilet replacement programs. If SMWC's aggressive water commodity pricing rate schedule and its education programs do not meet the required future water use objectives, SMWC will initiate the above-mentioned water conservation programs.

9.9 Adoption, Submittal and Implementation

This section describes SMWC's process for adopting, submitting, and implementing the 2020 IRUWMP and SMWC's WSCP.

9.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to SMWC's public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within SMWC's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

> SMWC provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in Part 4 Appendix I-2.

9.9.2 Public Hearing and Adoption

SMWC held a public hearing on June 18, 2021 to hear public comment and consider adopting this 2020 IRUWMP and SMWC's WSCP.

As part of the public hearing, the SMWC provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed SMWC the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

> SMWC's adoption resolution for the 2020 IRUWMP and SMWC's WSCP is included in Part 4 Appendix I-3.

9.9.3 Plan Submittal

SMWC will submit the 2020 IRUWMP and SMWC's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption.

> 2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

9.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, SMWC will make the plan available for public review during normal business hours by placing a copy of the 2020 IRUWMP and SMWC's WSCP at the front desk of the City's office, and by posting the plans on the City's website for public viewing.

9.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or SMWC's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

WEST VALLEY WATER DISTRICT

2020 IRUWMP

Part 2 Chapter 10

WVWD 2020 UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

10 RETAIL URBAN WATER MANAGEMENT PLAN
West Valley Water District

This chapter describes information specific to West Valley Water District, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet West Valley Water District's reporting requirements for 2020 under the UWMP Act.

10.1 System Description

West Valley Water District (WVWD) is a County Water District, a public agency of the State of California, organized and existing under the County Water District Law (Division 12, Section 30000 of the Water Code) of the State of California.

WVWD provides domestic water service to customers throughout southwestern San Bernardino County and a small portion of northern Riverside County, as part of the greater San Bernardino-Riverside-Ontario metropolitan area. The service area, approximately 50 miles east of downtown Los Angeles, generally includes the cities of Fontana, Rialto, Colton, Jurupa Valley, Bloomington, and other unincorporated areas of San Bernardino County. WVWD's service area is divided into northern and southern sections, with the central portion in between served by the City of Rialto.

IN THIS SECTION

WVWD is a retail public water supplier that meets the definition of an urban water supplier with over 23,000 municipal water service connections in 2020. The District provides potable water service to nearly 90,000 residents, as well as a myriad of commercial, industrial, and institutional establishments.

The District operates a domestic water distribution system that consists of 21 groundwater wells, 25 separate storage reservoirs across eight pressure zones, for a total storage over 72 million gallons (MG), and over 375 miles of transmission and distribution pipelines.

WVWD's service area is shown in **Figure 10-1**.

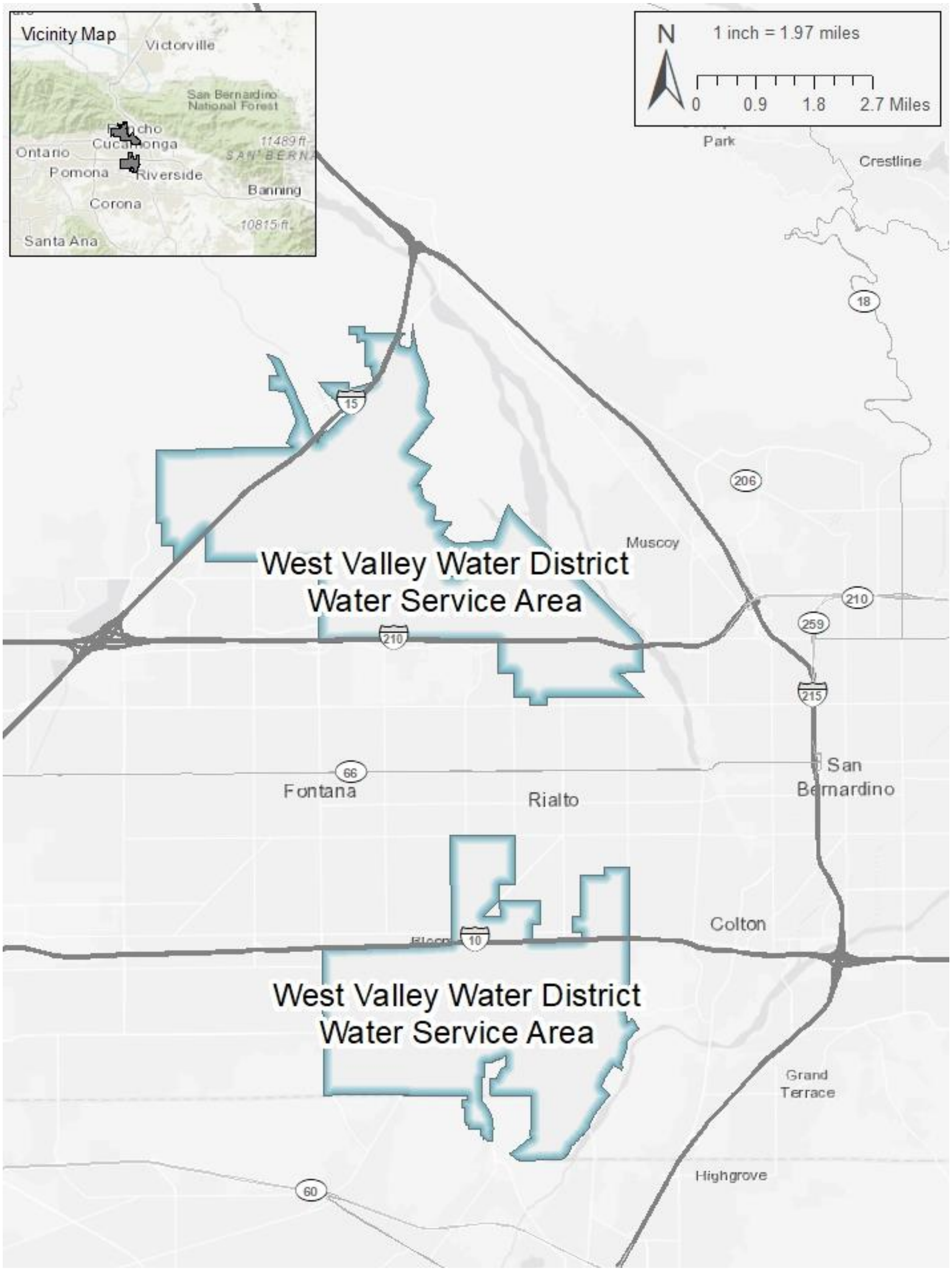


Figure 10-1: West Valley Water District Water Service Area Map

10.1.1 Population

For the purposes of consistent reporting of population estimates, the California Department of Water Resources (DWR) has developed a GIS-based tool (DWR Tool) to estimate the population within a water agency's service area using census data and number of water service connections. The DWR Tool was used to intersect the service area boundary with census data to provide population estimates for 1990, 2000, and 2010. The DWR Tool uses the number of service connections in those prior census years, where available, to calculate a persons-per-connection factor, which is then projected forward to estimate population in a given year using the number of connections in that year. The service area population for 2020 was estimated in the DWR Tool using the number of connections in 2010 and 2020.

To align with population projections in other recent planning documents, the 2020 WVWD Water Facilities Master Plan (WFMP) was used as the basis for estimating the population for future years. The WFMP projected the population in each year from 2018 to 2046, using a growth rate between 4.4% and 3.6% between 2018 and 2023, and a 1.5% growth rate after 2023. Using these assumptions from the WFMP, a uniform geometric growth rate of 2.84% was calculated for the period of 2020 and 2025. The 2.84% annual growth rate was applied to the DWR Tool 2020 population output to determine the 2025 population projection for this UWMP. The 1.5% annual growth rate was applied to the 2025 population projection to determine population projections for each 5-year period after 2025. Estimated 2020 and future year population is shown in **Table 10-1**.

WVWD prepared its WFMP population projection for years 2018-2023 based on District staff's knowledge of upcoming developments as well as land use data. Furthermore, WVWD prepared its population projection for years 2024 through 2046 based on data from the Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan which, with GIS analysis, was used to determine the population growth rate of 1.5% within the WVWD service area. SCAG prepared demographic forecasts based on land use data for their region through extensive processes that emphasize input from local planners and is done in coordination with local or regional land use authorities, incorporating essential information to reflect anticipated future populations and land uses. SCAG's projections undergo extensive local review, incorporate zoning information from city and county general plans, and are supported by Environmental Impact Reports.

As a comparison, a GIS analysis performed on SCAG's population data from the 2020 Connect SoCal Plan resulted in a future growth rate of 1.4% within the WVWD service area, just slightly below the SCAG projection from the 2012 Regional Transportation Plan. WVWD opted to use a future growth rate of 1.5% in order to maintain consistency throughout planning documents and because rapid growth has been occurring in the service area.

Table 10-1: DWR 3-1R Current and Projected Population

POPULATION SERVED	2020	2025	2030	2035	2040	2045
Total	**89,101**	**102,490**	**110,410**	**118,943**	**128,136**	**138,039**

10.1.2 Land Use

Per the 2020 WFMP, 29% of land within the WVWD service area is residential, 2% is commercial, 5% is public and institutional, 20% is industrial, 2% is utilities and other rights of way, 1% is landscape irrigation, 10% is open space, and 31% is vacant and undeveloped land.

10.2 Water Use

This section describes current and projected water uses within WVWD's service area. WVWD serves potable water for municipal and industrial use, and currently does not serve recycled or other non-potable water.

10.2.1 Water Use by Sector

WVWD categorizes its water customers into ten categories for the purposes of billing: Single Family, Multi-Family, Commercial, Industrial, Institutional, Landscape Irrigation, Hydrant, Golf Course, Fire Service, and Agricultural Irrigation. Hydrant connections are not actually permanent service connections but represent the amount of individual accounts that were opened that receive water directly from fire hydrants, such as for construction water. The number of active connections in each category from 2016 to 2020 are shown in **Table 10-2**.

WVWD delivers wholesale water through an interconnection with Marygold Mutual Water Company.

Table 10-2: West Valley Water District 2016-2020 Connections by Customer Class

CUSTOMER CLASS	2016	2017	2018	2019	2020
Single Family	19,385	19,814	20,280	20,759	21,362
Multi-Family	159	159	159	158	179
Commercial	525	532	541	551	571
Industrial	70	70	70	69	67
Institutional	97	97	97	97	95
Landscape Irrigation	343	357	377	396	421
Hydrant[1]	64	73	90	99	88
Golf Course	1	1	1	-	-
Fire Service	300	311	323	343	360
Agricultural Irrigation	10	10	8	8	8
Wholesale Water	1	1	1	1	1
TOTAL	**20,890**	**21,351**	**21,856**	**22,381**	**23,063**

[1]Hydrant connections represent accounts opened temporarily to receive delivery of water from hydrants.

10.2.1.1 Past Water Use

WVWD's actual water use by customer class from 2016-2020 is shown in **Table 10-3**. WVWD's water consumption by customer class in the last five years is shown in **Figure 10-2**. Approximately 62% of WVWD's total deliveries were to residential connections.

Table 10-3: 2016-2020 Actual Water Use (AF)

CUSTOMER CLASS	2016	2017	2018	2019	2020
Single Family	9,614	10,624	11,027	10,493	12,049
Multi-Family	469	468	472	487	481
Commercial	1,395	1,544	1,659	1,618	1,689
Industrial	661	725	732	592	623
Institutional	789	954	984	830	860
Landscape Irrigation	1,383	1,642	1,740	1,664	2,161
Hydrant	169	258	586	385	272
Golf Course	-	-	-	-	-
Fire Service	1	4	4	3	5
Agricultural Irrigation	105	101	92	63	70
Water Losses	1,243	545	1,016	2,011	1,889
TOTAL	**15,830**	**16,866**	**18,311**	**18,148**	**20,098**

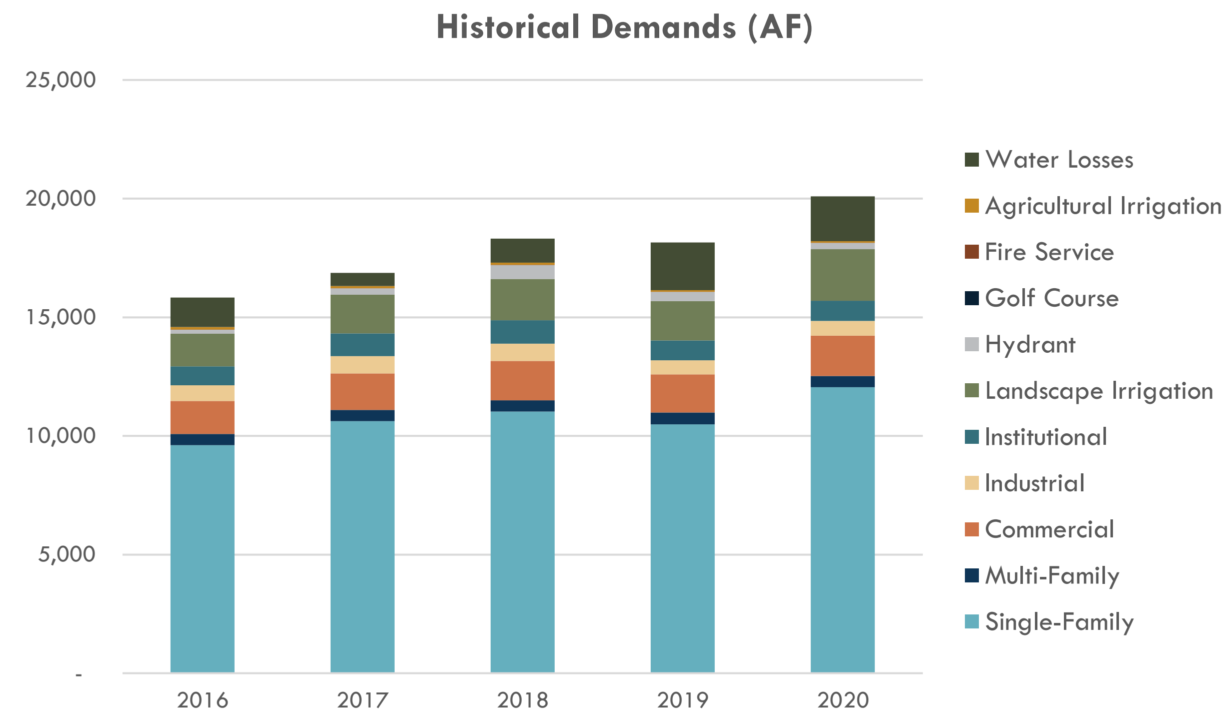


Figure 10-2: WVWD 2016-2020 Water Consumption by Customer Class (AF)

10.2.1.2 Distribution System Water Losses

Distribution system water losses are the physical potable water losses from the water system, calculated as the difference between water produced and the amount of water billed to customers plus other authorized uses of water.

Sources of water loss include:

- **Leaks from water lines.** Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall water loss. Aging pipes typically have more leaks.
- **Water used for flushing and fire hydrant operations.**
- **Unauthorized uses or theft of water.**
- **Customer Meter Inaccuracies.** Customer meters can under-represent actual consumption in the water system.

WVWD monitors its water loss and prepares an annual AWWA Water Audit, attached in **Part 4, Appendix J-8**, to estimate the volume of water loss. The results of the water audits from 2016 to 2019 are shown in **Table 10-4**. The 2020 water loss is estimated based on the difference between production and consumption for 2020.

WVWD will complete a 2020 AWWA Water Audit by October 1, 2021 in accordance with reporting requirements to the State.

Table 10-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)

REPORT PERIOD START DATE		
MM	YYYY	VOLUME OF WATER LOSS
1	2016	1,906
1	2017	2,176
1	2018	1,664
1	2019	1,802
1	2020	1,889 (Estimated)

In the past 5 years, WVWD's water loss has ranged from 9% - 13% of water sales. For the purposes of future water use projections, water loss is assumed to be 12% of projected water sales.

WVWD is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standard that is being developed by the State Water Board. Programs to manage water loss are described in **Section 10.8.1.5**. These programs will increase the efficiency of the water distribution system by decreasing future water losses; however, water losses cannot be prevented entirely.

10.2.2 Projected Water Use

A demand forecast tool was developed to estimate future demands based on individual customer categories and connections, with the ability to forecast how future changes in indoor and outdoor water use may impact overall water use within each different customer type for current and future customers.

The tool has three steps to project demand:

1. Establish a demand factor per connection for each customer class based on historical consumption data.
2. Project the number of new connections anticipated for each customer class in each 5-year period after 2020.
3. Modify demand factors as appropriate to account for expected changes in future water use.

The demand factors for each customer class were based on connection and demand data from 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 population growth rate for the period determined from the WFMP.

To estimate future water use for each customer category, the demand factor is multiplied by the number of estimated new connections and added to the 2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the total future water use. Projected future demands by customer class as well as estimated losses are presented in **Table 10-5**, **Table 10-6**, and **Figure 10-3**.

Table 10-5: DWR 4-2R Projected Demands for Water

	PROJECTED WATER USE				
CUSTOMER CLASS	2025	2030	2035	2040	2045
Single-Family	13,859	14,791	15,722	16,653	17,584
Multi-Family	553	591	628	665	702
Commercial	1,943	2,073	2,204	2,334	2,465
Industrial	717	765	813	861	909
Institutional	989	1,056	1,122	1,189	1,255
Landscape Irrigation	2,485	2,652	2,819	2,986	3,153
Hydrant	313	334	355	376	397
Golf Course	-	-	-	-	-
Fire Service	5	6	6	7	7
Agricultural Irrigation	81	86	92	97	103
Water Losses	2,513	2,682	2,851	3,020	3,189
TOTAL	**23,459**	**25,035**	**26,611**	**28,188**	**29,764**

Table 10-6: DWR 4-3R Total Gross Water Use

-	2020	2025	2030	2035	2040	2045
Potable and Raw Water From Table 4-1R and 4-2R	20,098	23,459	25,035	26,611	28,188	29,764
Recycled Water Demand From Table 6-4R	-	-	-	-	-	-
TOTAL WATER USE	**20,098**	**23,459**	**25,035**	**26,611**	**28,188**	**29,764**

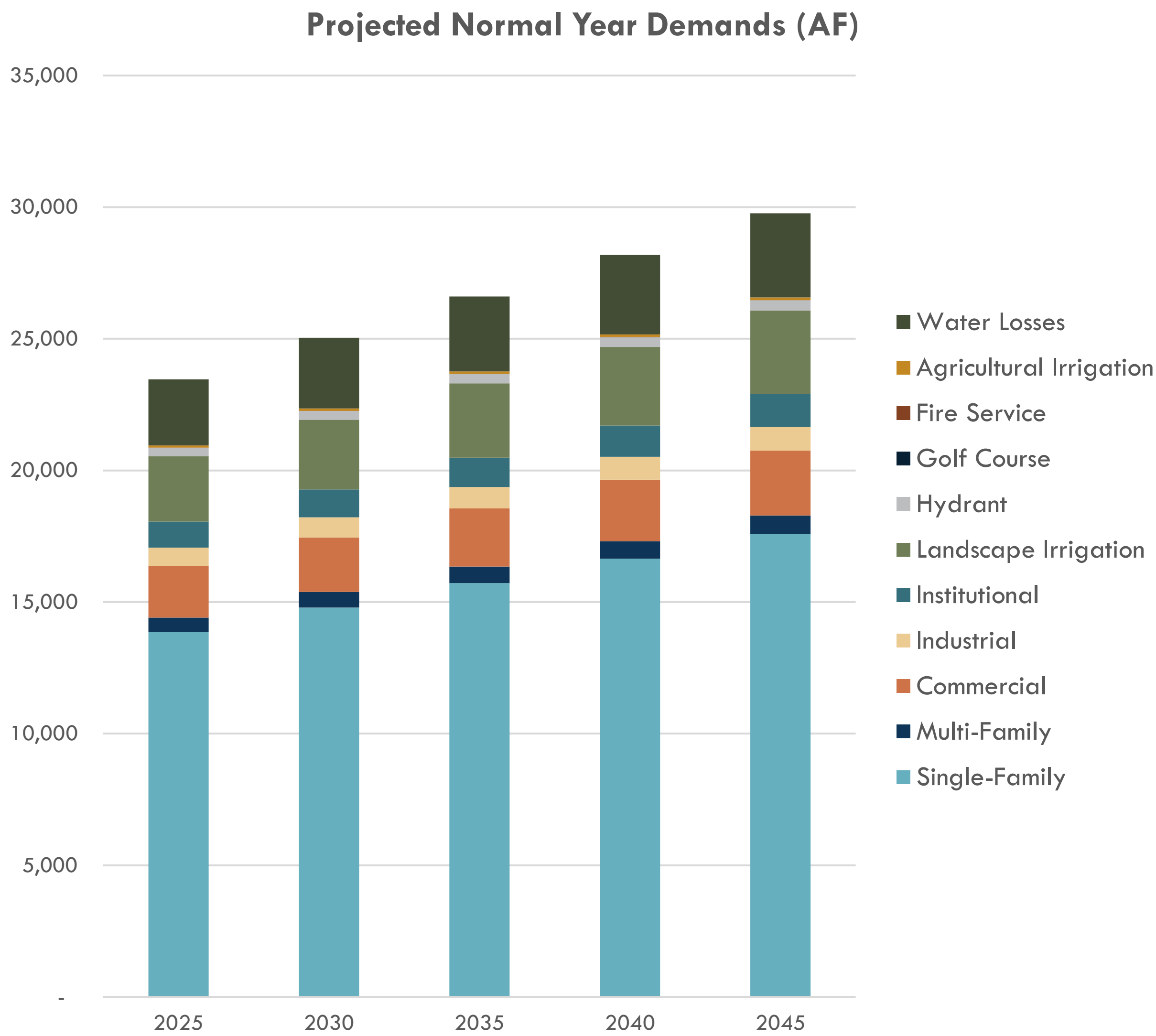


Figure 10-3: WVWD Projected Future Water Consumption by Customer Class (AF)

10.2.2.1 Estimating Future Water Savings

The demand tool used to project future water use has the capability to modify demand factors for both new and existing connections to quantify reductions in current and future customer demand that may occur as a result of active conservation programs implemented by WVWD or passive savings from more water efficient fixtures and landscapes that are required by current and future building codes and standards. WVWD may use this tool in the future to consider the impacts of changing customer water use on overall demand; however, WVWD has elected not to incorporate demand reductions from future conservation programs and passive savings from codes and standards into the demand projections at this time. In 2018, the legislature enacted SB 606 and AB 1668, which provide for implementation of a water budget-based approach to establishing new urban water use objectives for water suppliers. The series of water use efficiency standards that will inform calculation of WVWD's new water use objective are still under development and will take effect in 2023. Once the new standards have been established, WVWD will reevaluate customer demands and identify approaches to comply with the new standard, which will be incorporated into the next UWMP prepared in 2025. WVWD is committed to promoting water use efficiency and will continue to implement a comprehensive set of programs intended to reduce customer demands and support sustainable use of regional water supplies.

10.2.3 Water Use for Lower Income Households

Senate Bill 1087 requires that water use projections in an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier. WVWD serves portions of five jurisdictions: the City of Rialto, the City of Fontana, the City of Colton, the City of Jurupa Valley, and unincorporated San Bernardino county.

Based on SCAG's 6th cycle final regional housing needs allocation (RHNA), it is estimated that the weighted percentage estimate of very-low and low-income households in the WVWD service area is 44 percent. Therefore, it is assumed that 44 percent of future residential demands will come from very-low and low-income households. These demands have been included in the projections presented throughout this report.

10.2.4 Climate Change Considerations

A topic of growing concern for water planners and managers is climate change and the potential impacts it could have on California's future water supplies.

Recent climate change modeling for the SAR watershed suggests that a changing climate will have multiple effects on the Region. Adaptation and mitigation measures will be necessary to account for these effects. **Part 1 Chapter 2** includes an assessment of the potential impacts of climate change.

10.3 SBX7-7 Baseline and Targets

With the adoption of SBX7-7, also known as the Water Conservation Act of 2009, the State of California was required to reduce urban per capita water use by 20% by 2020. This section summarizes the past targets the WVWD developed and demonstrates that compliance by 2020 was achieved.

Water use targets were developed in terms of gallons per capita per day, or GPCD, which is calculated by dividing the total water from all customer categories by the population.

DWR has prepared standardized tables to record and document the calculations required for this section. The standardized tables for WVWD’s calculations are included in **Part 4 Appendix J-7**.

10.3.1 Baseline and Target

WVWD’s baseline and 2020 target was calculated in the 2015 RUWMP and has not changed for this plan. More details on the development of the baselines and target can be found in the 2015 RUWMP and **Part 4 Appendix J-7**. WVWD's calculated water use target for 2020 is 232 GPCD.

10.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD)

Through the implementation of its active water conservation program, WVWD has met its Confirmed Water use Target for 2020 of 232 GPCD, as shown in **Table 10-7**. To maintain this level of water use, WVWD intends to continue its current level of outreach and programs for the foreseeable future.

Table 10-7: SBX 7-7 2020 Compliance

2020 WATER USE TARGET GPCD	ACTUAL 2020 GPCD	SUPPLIER ACHIEVED TARGETED REDUCTION IN 2020?
232	201	Yes

10.4 Water Supply

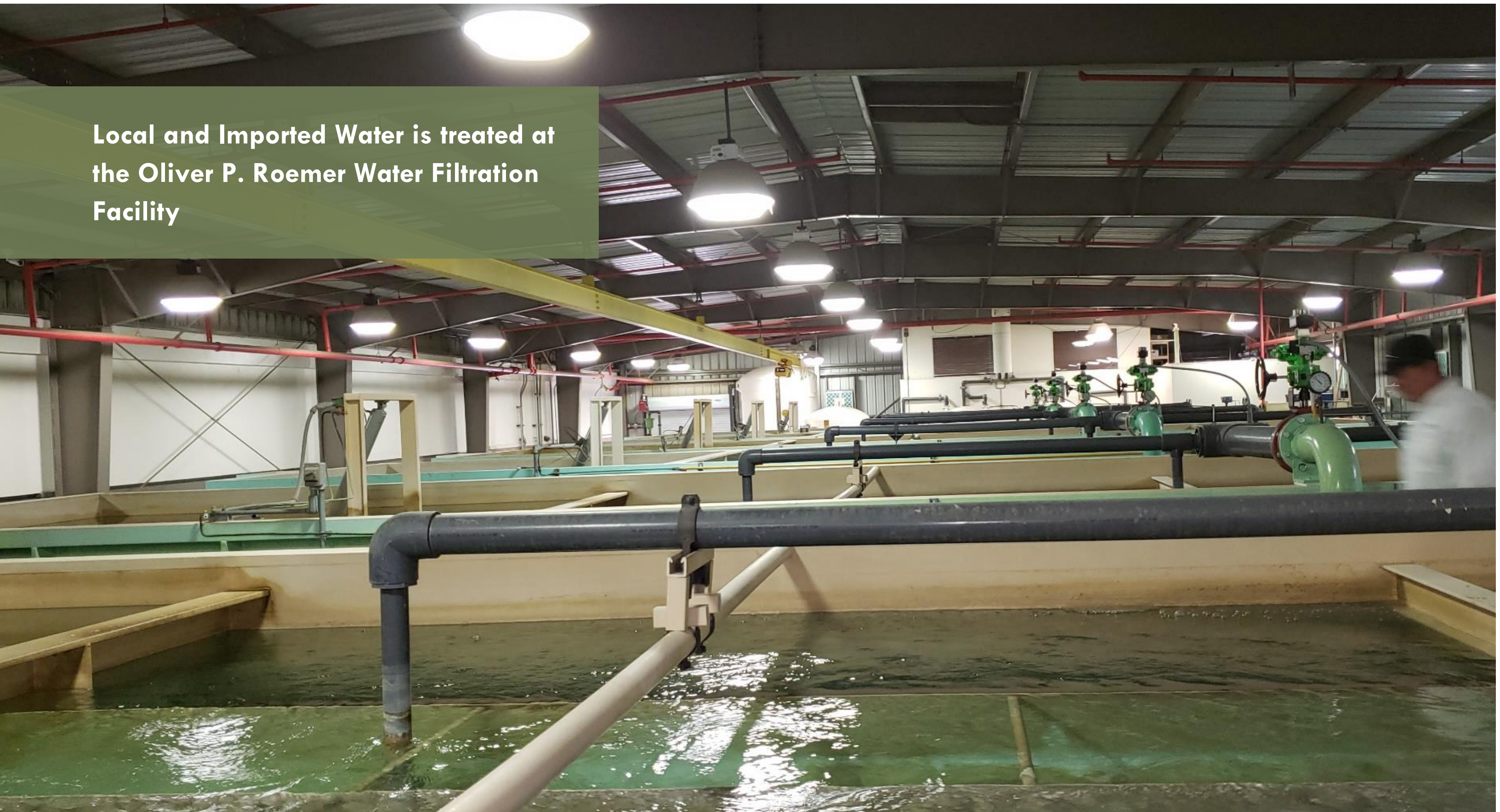
WVWD utilizes three primary sources for drinking water supply: local surface water from flows on the east side of the San Gabriel Mountains, including North Fork Lytle Creek, Middle Fork Lytle Creek, and South Fork Lytle Creek; groundwater; and imported water from the State Water Project (SWP).

More information about local surface water and groundwater basins is included in **Part 1 Chapter 3** of the 2020 IRUWMP.

10.4.1 Purchased or Imported Water

WVWD receives SWP water from Valley District through the Lytle Turnout off the San Gabriel Feeder Pipeline. Metering and transmission facilities are sized to enable WVWD to purchase and treat up to 20 million gallons per day (MGD), approximately 23,000 AFY, at final treatment plant expansion. SWP water is treated at the District’s Oliver P. Roemer Water Filtration Facility (WFF) and used for potable supply, and WVWD is investigating the use of SWP water for groundwater recharge in the Lytle Creek Basin. In 2006 the WFF was expanded to increase production capacity to 14.4 MGD. In 2020, WVWD began the design of a 7.2 MGD expansion of the WFF to increase capacity to 21.6 MGD. WVWD has been utilizing SWP water through the Lytle Turnout since 1999.

WVWD does not have a specific allocation of SWP water from Valley District but expects to receive the projected volumes of SWP under most conditions. A description of this supply and its reliability is provided in **Part 1 Chapter 3 and Chapter 5**. This supply is not guaranteed so WVWD maintains 100% reliability from other sources.



Local and Imported Water is treated at the Oliver P. Roemer Water Filtration Facility

10.4.2 Groundwater

WVWD draws the majority of its water supply from its wells. WVWD can extract groundwater from five regional groundwater basins: Bunker Hill and Lytle Creek (which are both part of the San Bernardino Basin or SBB), Rialto-Colton, Riverside North, and Chino Basins. All five basins have been adjudicated and are managed for long term sustainability, as discussed further in **Part 1 Chapter 3**. WVWD's historical production for the past five years is shown in Table 10-8.

10.4.2.1 Bunker Hill and Lytle Creek (Part of SBB)

WVWD produces groundwater from the SBB, described in detail in **Part 1 Chapter 3**. Per the Western-San Bernardino Judgement, WVWD is not limited in the amount of groundwater they can produce from the SBB. Restrictions on WVWD's rights from the SBB are that the water must be used within the boundaries of Valley District.

10.4.2.1.1 Baseline Feeder

In addition to its own wells in SBB, WVWD also receives Bunker Hill Sub-basin water from the Baseline Feeder.

In 1991 WVWD entered into a joint venture agreement with Valley District, the City of Rialto and the Riverside Highland Water Company to construct the Baseline Feeder. The Baseline feeder is a 48- inch transmission main with a capacity of 60 MGD designed to transport water from the Bunker Hill basin west to the WVWD area. WVWD has a contract with Valley District for delivery of 5,000 AFY to be provided by Valley District. West Valley owns 33 percent of the pipeline from Meridian Avenue and Baseline Road to Cactus Avenue and Baseline Road. In 1991 WVWD and the City of Rialto entered into an agreement with SBVMWD to participate in the financing of reaches one and two of the pipeline. The WVWD and the City of Rialto were then obligated to purchase 5,000 AFY and 2,500 AFY respectively, at an approximate cost of $130 to 140 per acre foot for 20 years.

In 2012, the parties to the agreement entered into a Restated and Amended Agreement to jointly construct, operate, and maintain a 1.0-million-gallon reservoir and booster station to boost water from two new wells in the 9th Street and Lytle Creek Wash area into the Baseline Feeder. The reservoir is used to remove entrapped air from the well discharges.

All water delivered through the Baseline Feeder is Bunker Hill groundwater and is included in West Valley's total Bunker Hill production for the purposes of this plan.

10.4.2.2 Rialto-Colton

WVWD has groundwater extraction rights in the Rialto-Colton Basin, specifically within the boundary of the 1961 Rialto Decree, discussed in more detail in **Part 1 Chapter 3**. In any year in which the average of the elevation of the spring-high water level, measured in March, April, and May, in the three index wells is above 1002.3 feet msl, WVWD has no restrictions on yearly extractions. When the average standing water levels in the three index wells falls below 1002.3 feet msl and is above 969.7 feet msl, WVWD is restricted to total groundwater extractions of

6,104 AFY. When the average of the three index wells drops below 969.7 feet msl, ground water extractions are reduced for all parties stipulated in the decree by 1 percent per foot below the 969.7-foot level, but not to exceed 50-percent reduction.

WVWD has a total water right allocation in the Rialto Basin of 6,104 AFY, including 510 AFY that are fixed rights and 5,594 AFY that are adjustable and subject to a percent reduction each year based on groundwater levels in the index wells. Over the previous 10 years, the percent reduction has ranged from 7 percent in 2010 to 29 percent in 2020. For the purposes of this plan, WVWD and the other agencies who pump from the Rialto Basin are assuming a 30-percent reduction in adjustable rights in 2025 and a 2% gain in adjustable rights for every 5-year period thereafter based on planned recharge to increase water levels and adjustable rights.

> For 2025, WVWD's available water supply from the Rialto Basin is expected to be 4,426 AFY (510 AFY fixed plus 5,594 AFY reduced by 30 percent). By 2045, the average water supply is assumed to increase to 4,873 AFY.

As discussed further in **Part 1 Chapter 3**, WVWD participates in the Rialto Basin Groundwater Council (Rialto Basin GC), which was formed in 2021. The Rialto Basin GC will develop, adopt, and implement a sustainable groundwater management plan, which will include implementing groundwater recharge projects to restore groundwater levels.

10.4.2.3 Riverside North

WVWD also produced water from the Riverside North groundwater basin. This basin was discussed further in **Part 1 Chapter 3**.

10.4.2.4 Chino Basin

WVWD owns rights to approximately 900 AF of production in the Chino Basin. Due to water quality constraints this supply is not currently being used. In the near term, WVWD is looking at options to utilize their water rights in this basin including nitrate treatment and the delivery of this supply through interties with other agencies. By 2030, WVWD may use the supply directly.

Table 10-8: DWR 6-1R Groundwater Pumped Last Five Years (AF)

GROUNDWATER TYPE	LOCATION OR BASIN NAME	2016	2017	2018	2019	2020
Alluvial Basin	Bunker Hill (part of SBB)	5,452	5,640	5,777	4,508	5,549
Alluvial Basin	Lytle (part of SBB)	1,850	2,365	2,416	2,572	3,078
Alluvial Basin	Chino	-	-	-	-	-
Alluvial Basin	Rialto-Colton	2,123	3,923	3,353	2,779	1,420
Alluvial Basin	Riverside-Arlington	2,745	1,089	1,542	1,301	1,354
	TOTAL	**12,170**	**13,017**	**13,088**	**11,159**	**11,401**

10.4.3 Surface Water

WVWD has the right to divert and export out of the Lytle Creek Region 2,290 gpm when it is available. WVWD can also purchase an additional 1,350 gpm of Lytle Creek flows through an agreement with the City of San Bernardino (San Bernardino is not able to utilize their surface water flows), which is treated at the Oliver P. Roemer WFF. WVWD also utilizes small amounts of Lytle Creek surface water flows for groundwater recharge in the Lytle Creek Basin.

When the flows at the mouth of Lytle Creek Canyon drop below 7,182 gpm (798 miners inches), all diversion rights holders must reduce their diversions to a prorated schedule set in the 1897 decree. If WVWD is not receiving its full Lytle Creek surface water allotment, they are permitted to make up the difference by additional pumping in the Lytle Creek Region.

10.4.4 Stormwater

WVWD is participating in regional project planning efforts to capture additional stormwater for purposes of groundwater recharge to increase sustainability of the basins WVWD produces water from. These regional projects are discussed in **Part 1 Chapter 3**.

10.4.5 Wastewater and Recycled Water

The wastewater collected within different portions of the WVWD water service area is treated by the City of Rialto (City), the City of Colton, San Bernardino County, or the Inland Empire Utilities Agency. The majority of the wastewater collected in the WVWD service area goes to the City of Rialto Wastewater Treatment Plant (WWTP), which has a 12.0 MGD tertiary treatment plant capacity with a current flow of approximately 7 MGD. All of the City of Rialto's treatment plant effluent meets Title 22 for recycled water usage in restricted irrigation. A small amount of water is used for landscape irrigation and the rest is discharged into the Santa Ana River.

> It is estimated that approximately 57 percent or 4 MGD of the wastewater collected at City of Rialto WWTP was generated within WVWD's water service area in 2020.

Information about wastewater collected is presented in **Table 10-9**.

10.4.5.1 Potential, Current, and Projected Recycled Water Uses

WVWD has evaluated the feasibility of adding recycled water as a non-potable supply, but would rely on the City of Rialto or San Bernardino County to provide the recycled water from their wastewater treatment facilities.

In 2012, WVWD prepared a master plan to evaluate potential uses of recycled water within its service area. WVWD does not currently have a recycled water distribution system and is not pursuing recycled water use at this time because it is not cost effective to extend facilities from the wastewater treatment plants to the locations of potential use. However, recycled water is utilized regionally for meeting habitat needs in the Santa Ana River (see **Part 1 Chapter 3.4**).

Table 10-9: DWR 6-2R Wastewater Collected within Service Area in 2020 (AF)

WASTEWATER COLLECTION			RECIPIENT OF COLLECTED WASTEWATER			
NAME OF WASTEWATER COLLECTION AGENCY	WASTEWATER VOLUME METERED OR ESTIMATED	WASTEWATER VOLUME COLLECTED FROM UWMP SERVICE AREA IN 2020	NAME OF WASTEWATER AGENCY RECEIVING COLLECTED WASTEWATER	WASTEWATER TREATMENT PLANT NAME	WASTEWATER TREATMENT PLANT LOCATED WITHIN UWMP AREA	WWTP OPERATION CONTRACTED TO A THIRD PARTY
City of Rialto	Estimated	4,336	City of Rialto	Rialto Wastewater Treatment Plant	Yes	Yes
City of Colton	Estimated	532	City of Colton	Colton WWTP	No	No
San Bernardino County	Estimated	329	San Bernardino County	Lytle Creek North Water Reclamation Plant	No	No
Inland Empire Utilities Agency	Estimated	971	Inland Empire Utilities Agency	Recycled Plant No. 4	No	No
	TOTAL	**6,608**				

10.4.6 Water Exchanges and Transfers

WVWD is looking at options for the potential transfer of their Chino Basin water rights from agencies currently pumping Chino Basin water. WVWD does not anticipate any other regular or long-term transfers or exchanges, during the period covered by this Plan. Any transfer or exchanges would be as-needed related to an emergency.

10.4.6.1 Emergency Interties

WVWD currently has interconnections with the Cities of Rialto, Colton and San Bernardino, the Fontana Water Company, Marygold Mutual Water Company, and Valley District which can be utilized as needed for short-term supply needs. These connections are not typically used for extended periods.

10.4.6.2 Future Water Projects

To meet the future demands within the system, WVWD plans to rehabilitate existing wells, to drill new wells, and equip wells with wellhead treatment if required. These wells are planned for various groundwater basins and pressure zones within the distribution system.

Groundwater is not the only planned supply source to be utilized by WVWD to meet the anticipated future demands. WVWD is expanding the Oliver P. Roemer Water Filtration Facility by 7.2 MGD for a total capacity of 21.6 MGD to allow additional treatment of SWP water when available.

When planning future water supply sources, WVWD selects projects that will provide sufficient supply to meet peak day demands. When possible, these sources are planned by pressure zone, thereby reducing the need to lift water to a higher zone.

As development progresses and increased demands are placed on the system, WVWD will determine which projects to implement. Although WVWD may not need to utilize each source to its full potential, construction of these water supply projects gives WVWD this option should one or more sources be off line due to maintenance.

As part of the Rialto Basin GC, WVWD plans to collaborate with the other parties to implement groundwater recharge in the Rialto Basin to increase water levels. Increased water levels will result in an increase in WVWD's allowable pumping from the Rialto Basin, thereby increasing supply. The Rialto Basin GC will be developing a groundwater management plan that will identify recharge goals and projects and the potential supply increase is not yet quantified.

10.4.7 Summary of Existing and Planned Sources of Water

WVWD's water supply is comprised of local groundwater, surface water and SWP water. A similar mix of supplies is anticipated to be used in the future. The volume of water utilized from each source in 2020 is summarized in **Table 10-10** and projected supply by source is summarized in **Table 10-11**.

Table 10-10: DWR 6-8R Actual Water Supplies in 2020 (AF)

		2020		
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater (not desalinated)	Bunker Hill (part of SBB)	5,549	Drinking Water	See Note
Groundwater (not desalinated)	Lytle (part of SBB)	3,078	Drinking Water	See Note
Groundwater (not desalinated)	Rialto-Colton	1,420	Drinking Water	See Note
Groundwater (not desalinated)	Riverside-Arlington	1,354	Drinking Water	See Note
Surface water (not desalinated)	Lytle Creek	5,356	Drinking Water	
Purchased or Imported Water	State Water Project - Direct Delivery	3,342	Drinking Water	
-	**TOTAL:**	**20,098**		**-**

See Part 1 Chapter 3 for discussion of safe yield of regional groundwater basins.

Table 10-11: DWR 6-9R Projected Water Supplies (AF)

		PROJECTED WATER SUPPLY				
		2025	2030	2035	2040	2045
WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	Bunker Hill (part of SBB)	2,052	2,353	3,554	4,754	6,455
Groundwater (not desalinated)	Bunker Hill (part of SBB, via Baseline Feeder)	5,000	5,000	5,000	5,000	5,000
Groundwater (not desalinated)	Lytle (part of SBB)	2,900	2,900	2,900	2,900	2,900
Groundwater (not desalinated)	Rialto-Colton	4,426	4,538	4,650	4,761	4,873
Purchased or Imported Water	State Water Project - Rialto Colton Groundwater Supplemental Supply	-	-	-	-	-
Groundwater (not desalinated)	Riverside-Arlington	2,500	3,000	3,500	4,000	4,000
Groundwater (not desalinated)	Chino	-	900	900	900	900
Surface water (not desalinated)	Lytle Creek	3,100	3,100	3,100	3,100	3,100
Purchased or Imported Water	State Water Project - Direct Delivery	7,000	7,000	7,000	7,000	7,000
	TOTAL:	26,978	28,791	30,603	32,415	34,229

Supplies shown in this table are planned pumping or diversions, except supplies from San Bernardino Basin are increased to meet the Total Supply Target with 15% Reliability Factor.

Table 10-12: DWR 7-2R Normal Year Supply and Demand Comparison (AF)

-	2025	2030	2035	2040	2045
Supply Totals From Table 6-9R	26,978	28,791	30,603	32,415	34,229
Demand Totals From Table 4-3R	23,459	25,035	26,611	28,188	29,764
DIFFERENCE:	**3,519**	**3,756**	**3,993**	**4,227**	**4,464**

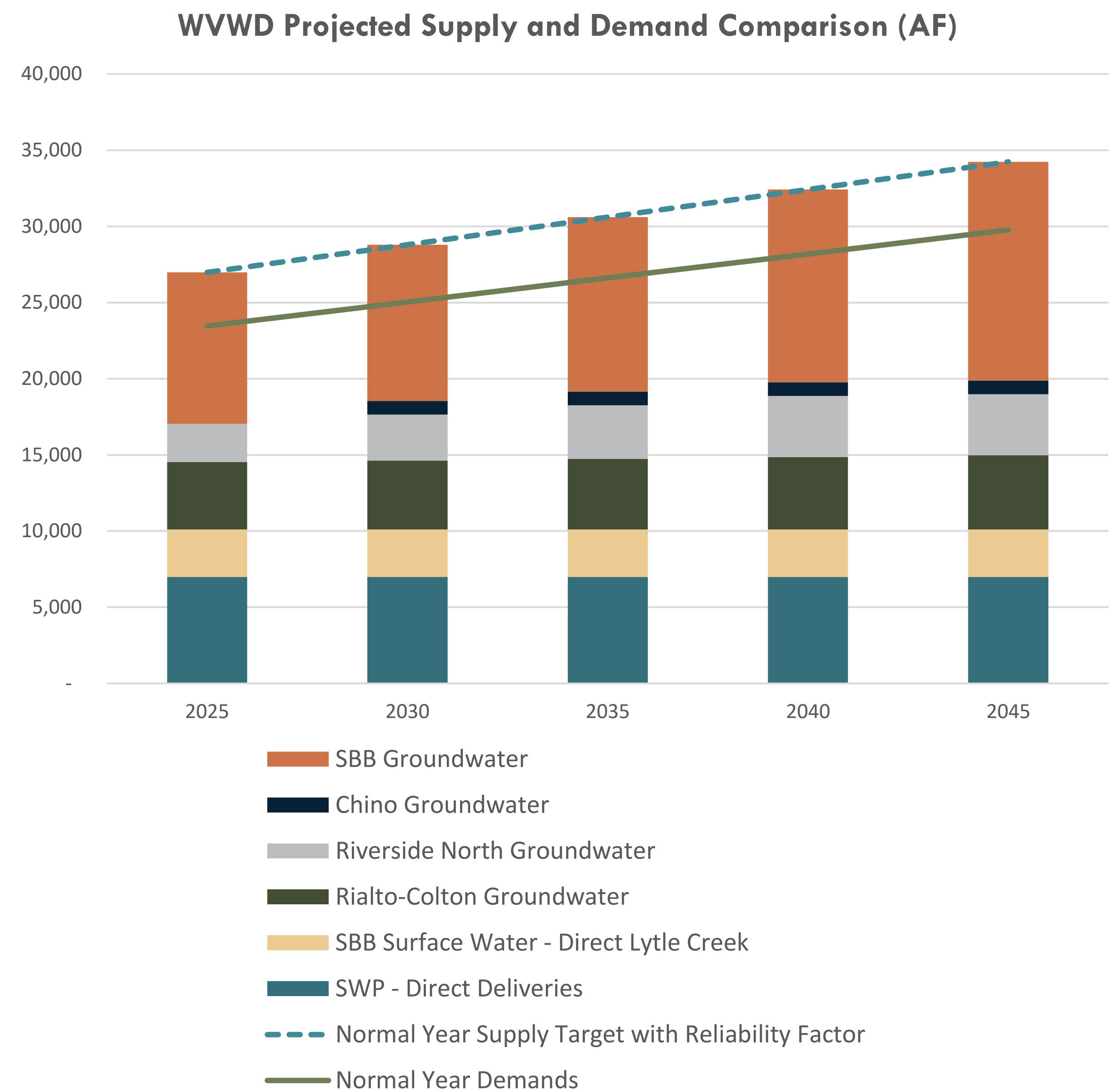


Figure 10-4. Projected Normal Year Supply and Demand Comparison (AF)

10.4.8 Energy Intensity

Reporting water energy intensity has many benefits for water utilities and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.

- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use at each water acquisition and delivery step and the ability to compare energy use among similar agencies.
- WVWD has a Hydroelectric plant that generates power from SWP water delivered and treated at the WFF. Power generated from the hydro plant is used to offset electricity used at the WFF.

In 2020, WVWD consumed 885.8 kWh of energy for water facilities per AF of water delivered.

10.5 Water Service Reliability Assessment

This section considers WVWD's water supply reliability during normal years, single dry years, and up to 5 consecutive dry water years. The supply reliability assessment discusses factors that could potentially limit the expected quantity of water available from WVWD's current source of supply through 2045.

Influent and Effluent Pump Stations at the Oliver P. Roemer Water Filtration Facility

10.5.1 Constraints on Water Sources

During times of State-wide drought conditions, the availability of SWP water may be reduced. These conditions are normally anticipated in advance to an extent, providing WVWD with the opportunity to plan for the reduced supply. During a drought period when SWP supplies are reduced, Valley District prioritizes direct deliveries to the water treatment plants, including WVWD's, but if deliveries are reduced, WVWD will shift to other local supplies.

The local groundwater and surface water supplies are influenced by annual precipitation. In extended drought conditions, the surface water supplies in the Lytle Creek region can be severely impacted. In addition, groundwater levels in the Lytle Creek Basin have been known to drop over 300 feet during extended drought periods. As a result, WVWD transitions to groundwater produced from the Bunker Hill Sub-basin when surface water and groundwater supplies from the Lytle Creek region are limited.

WVWD's pumping rights in the Rialto Basin are determined by groundwater levels. While WVWD and the Rialto Basin GC plan to recharge the basin to increase water levels, WVWD's pumping rights could be reduced if groundwater levels decline.

If WVWD's other supplies are reduced, they can shift production to the Bunker Hill or Riverside North basins if additional supply is needed.

Some of the WVWD's wells have been impacted by arsenic, perchlorate, MTBE, 1,2,3-TCP, and volatile organic carbons (VOCs). WVWD has implemented wellhead treatment as needed and continues to monitor groundwater contamination and the movement of groundwater contaminant plumes. These past and ongoing groundwater treatment projects have demonstrated that treatment is an economically viable alternative for handling arsenic, perchlorate and VOCs. Based on current conditions, water quality is not anticipated to affect WVWD supply reliability. However, water quality issues are constantly evolving. WVWD will take action to protect and treat supply when needed, but it is well recognized that water quality treatment can have significant costs. These water quality issues are further discussed at a regional level in **Part 1 Chapter 3**.

10.5.2 Year Type Characterization

In general, groundwater is 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 BTAC, monitor groundwater levels and implement supplemental recharge to maintain long term sustainability of local groundwater sources. Further discussion of regional water resource management is included in **Part 1 Chapter 3**.

Per UWMP requirements, WVWD has evaluated reliability for an average year, single dry year, and a 5 consecutive dry year period. The UWMP Act defines these years as:

- **Normal Year:** this condition 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.
- **Single Dry Year:** the single dry year is recommended to be the year that represents the lowest water supply available.
- **Five-Consecutive Year Drought:** the driest five-year historical sequence for the Supplier, which may be the lowest average water supply available for five years in a row.

10.5.3 Water Service Reliability

The results of the reliability assessment are summarized in the tables below.

Under single dry and consecutive dry year conditions, the assessment assumes that demands will increase by as much as 10% due to increased outdoor water use. 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% increase throughout the 5-year drought to be conservative.

As described in **Part 1, Chapter 3**, the effects of a local drought are not immediately recognized since the region uses the local groundwater basins to simulate a large reservoir for long term storage. While pumping rights from the Rialto Basin and available surface water may be reduced in dry years, WVWD is able to pump additional groundwater from Bunker Hill, Lytle and Riverside North to meet total demands in dry years and participates in efforts to replenish the basins with imported and local water through regional recharge programs. WVWD's total groundwater supplies are not reduced in dry years so 2020 is considered the base year for all year types. Based on the analysis, WVWD does not anticipate any shortage due to single or consecutive dry years. Even though localized drought conditions should not affect supply, WVWD participates in several ongoing water conservation measures and regional recharge projects to optimize and enhance the use and reliability of regional water resources. WVWD also has a water shortage contingency plan to put into action as appropriate to reduce the demand during critical drought years or other supply emergencies.

A summary of the basis of water year data is presented in **Table 10-13.** The percent of average supply increases in drought years because WVWD's groundwater production will increase to meet an assumed increase in demands.

Table 10-13. DWR 7-1R Basis of Water Year Data

YEAR TYPE	BASE YEAR	AVAILABLE SUPPLY IF YEAR TYPE REPEATS AS PERCENT OFAVERAGE SUPPLY
Average Year	2020	100%
Single-Dry Year	2020	110%
Consecutive Dry Years 1st Year	2020	110%
Consecutive Dry Years 2nd Year	2020	110%
Consecutive Dry Years 3rd Year	2020	110%
Consecutive Dry Years 4th Year	2020	110%
Consecutive Dry Years 5th Year	2020	110%

The projected supply and demand during a normal year are shown in **Table 10-12**.

The projected supply and demand during a single dry year are shown in **Table 10-14**. WVWD's demands in single dry years are assumed to increase by 10% above normal year demands. The local groundwater basins WVWD produces water from have storage for use in dry years so WVWD can produce the volume of water needed to meet 100% of demands in single dry years. WVWD's supplies are 100% reliable during single dry years.

Table 10-14. DWR 7-3R Single Dry Year Supply and Demand Comparison (AF)

-	2025	2030	2035	2040	2045
Supply Totals	29,676	31,670	33,663	35,657	37,651
Demand Totals	25,805	27,539	29,273	31,006	32,740
DIFFERENCE:	**3,871**	**4,131**	**4,391**	**4,651**	**4,911**

The projected supply and demand during five consecutive dry years are shown in **Table 10-15**. WVWD's demands in multiple dry years are assumed to increase by 10% above normal year demands. The local groundwater basins WVWD produces water from have storage for use in dry years so WVWD can produce the volume of water needed to meet 100% of demands in multiple dry years. WVWD's supplies are 100% reliable during multiple dry years.

Table 10-15. DWR 7-4R Multiple Dry Years Supply and Demand Comparison

		2025	2030	2035	2040	2045
First Year	Supply Totals	29,676	31,670	33,663	35,657	37,651
	Demand Totals	25,805	27,539	29,273	31,006	32,740
	DIFFERENCE:	**3,871**	**4,131**	**4,391**	**4,651**	**4,911**
Second Year	Supply Totals	29,676	31,670	33,663	35,657	37,651
	Demand Totals	25,805	27,539	29,273	31,006	32,740
	DIFFERENCE:	**3,871**	**4,131**	**4,391**	**4,651**	**4,911**
Third Year	Supply Totals	29,676	31,670	33,663	35,657	37,651
	Demand Totals	25,805	27,539	29,273	31,006	32,740
	DIFFERENCE:	**3,871**	**4,131**	**4,391**	**4,651**	**4,911**
Fourth Year	Supply Totals	29,676	31,670	33,663	35,657	37,651
	Demand Totals	25,805	27,539	29,273	31,006	32,740
	DIFFERENCE:	**3,871**	**4,131**	**4,391**	**4,651**	**4,911**
Fifth Year	Supply Totals	29,676	31,670	33,663	35,657	37,651
	Demand Totals	25,805	27,539	29,273	31,006	32,740
	DIFFERENCE:	**3,871**	**4,131**	**4,391**	**4,651**	**4,911**

10.6 Drought Risk Assessment

The Drought Risk Assessment (DRA) is a new analysis required for the 2020 UWMP, with a focus on the five-year consecutive drought scenario beginning in 2021. Because WVWD relies on groundwater basins with significant storage, available supplies do not vary on a monthly or seasonal basis, so this analysis is conducted on an annual basis. Projected demands and supplies from 2021-2025 are shown in **Table 10-16.**

Demands for 2021 – 2025 were assumed to increase at a uniform rate between the 2020 actual use and 2025 projected use and were then increased by 10% to reflect higher anticipated demands during dry years. This DRA uses the same water supply reliability assumptions used in the Water Service Reliability Assessment described in **Section 10.5** and the 15% Reliability Factor is also applied to supplies in this DRA, therefore, this analysis shows a 15% supply surplus for WVWD. WVWD can produce additional groundwater to meet any increases in demand in dry years. As shown in **Part 1 Chapter 5**, the region as a whole has sufficient supplies to meet demands plus the 15% Reliability Factor, even in a 5-year drought. As shown in **Part 1 Chapter 5 Figure 5-1**, the SBB had over 4.8 million acre-feet in storage as of 2020 due to regional efforts to store water in wet years for use during dry years.

> Although projections in this Plan show that the regional water supplies are sufficient to meet the demands of WVWD and the Region as a whole, even during a 5-year drought (see Part 1 Chapter 5), WVWD remains committed to water conservation and to being a good steward of regional water resources to preserve supplies for the future due to the possibility of experiencing more severe droughts than anticipated in this Plan.

Table 10-16: DWR 7-5 Five-Year Drought Risk Assessment (AF)

2021	Gross Water Use	22,848
	Total Supplies	26,275
	SURPLUS	**3,427**
2022	Gross Water Use	23,587
	Total Supplies	27,125
	SURPLUS	**3,538**
2023	Gross Water Use	24,326
	Total Supplies	27,975
	SURPLUS	**3,649**
2024	Gross Water Use	25,066
	Total Supplies	28,825
	SURPLUS	**3,760**
2025	Gross Water Use	25,066
	Total Supplies	28,825
	SURPLUS	**3,760**

10.7 Water Shortage Contingency Plan

The Water Shortage Contingency Plan (WSCP), which is a strategic plan that WVWD 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 a number of reasons, such as water supply 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 WVWD 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 WVWD maintain reliable supplies and reduce the impacts of any supply shortages and/or interruptions.

The WSCP was prepared in conjunction with the 2020 IRUWMP and is a standalone document that can be modified as needed. WVWD's WSCP is attached as **Part 4 Appendix J-9**.

10.8 Demand Management Measures

The Demand Management Measures (DMMs) section provides a comprehensive description of the water conservation programs that WVWD has implemented for the past five years, is currently implementing, and plans to implement in order to reduce demand. WVWD's current per-capita consumption is less than its 2020 compliance target. WVWD expects to continue to implement current conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

10.8.1 Existing Demand Management Measures

The following Section identifies the water demand management measures currently implemented or scheduled for implementation by WVWD. Water conservation programs and incentives offered by the City of Rialto will also benefit SBVMWD and WVWD. In order to effectively implement water conservation programs, WVWD collects data for customers within the WVWD Water Service area only. WVWD recognizes that demand management measures are important for the reliability of its water sources and has made a continued effort to comply with the DMMs required by the act.

10.8.1.1 Water Waste Prevention Ordinances

WVWD, through Article 24, lists use of water considered non-essential to the public health, safety and welfare and, defines what constitutes water wasting pursuant to Water Code Section 350 et seq., Water Code Section 71640 et. seq., and the common law. Article 24 was adopted on August 6, 2015 and is provided in **Part 4 Appendix J-9**.

10.8.1.2 Metering

WVWD has changed its entire meter stock to Automatic Meter Reading (AMR). This system eliminates the need for each meter to be visually read by a technician and ensures that water usage is billed correctly. The AMR system is also highly useful in identifying and addressing customer-side leaks, as well as for understanding and assessing the impacts of various conservation programs.

10.8.1.3 Conservation Pricing

WVWD is in compliance with this DMM. The volumetric portion of District's water revenue accounts for about 71 percent of total revenue. WVWD has a tiered water rate system that is always in place. WVWD charges customers increasing rates based on their water usage during a billing cycle to encourage water conservation.

WVWD completed a rate study in 2012 and implemented an Inclining Block Rate tiered rate structure starting January 1, 2013 (Tier One - 1-10 units, Tier Two - 11-50 units, Tier Three - 51+ units).

10.8.1.4 Public Education and Outreach

WVWD provides informational materials to customers through paid advertising, classes, water bills, a website, quarterly newsletters and social media. WVWD has expanded their social media outreach to include Facebook, Twitter, Instagram, Nextdoor and Linkedin. The main objectives are simply to promote water conservation, to educate and increase awareness of the importance of water use efficiency and to encourage our customers to become active members in all these activities within our communities.

WVWD will be revamping its website to include multiple pages on information for water conservation including rebates and programs that WVWD is participating in and water conservation tips for indoor and outdoor use. WVWD's conservation piece of the website is updated on a regular basis to include new ideas.

Current GIS technologies allow us to provide direct communication channels for our customers in real time to interact with the District through cloud-based solutions. These solutions are simply online forms, called GeoForms, which have the functionality of embedded e-mail communications and alert mechanisms so that when a customer submits one of these forms online through a smart device, GIS and other related departments receive real-time email containing all the details related to the online forms. Based on three different targeted water conservation efforts, three different online applications, GeoFroms, are developed in GIS for our customers. Instead of generating one big online form to include all incentives in one application, specific online forms are generated for each individual incentive. The same format is used for each online form, but each online form's content is specifically tailored for individual rebate programs.

The first application is designed mainly to report any water-related issues that cause water loss in the communities. The application provides fields to be filled in by the customers along with the incident types and severity level along with the incident locations and customer information. These incidents could be a water leak, hit or broken hydrant, water pressure issues as well as water quality issues. This online application allows customers to submit an online form to request the District to address such issues via WVWD's website. This will then electronically trigger an alert email notification to rapidly address the issues that are reported.

WVWD continues to hold water conservation classes for students at local elementary, middle and high schools located within WVWD. The District also gives tours to local schools of the Treatment Plants and hands out conservation materials.

For the last 15 years WVWD has sponsored a Water Conservation Poster Contest with the elementary schools located in the District. On average 25 teachers participate in the contest as well as over 150 entries. The District also has conservation messages appearing directly on the customer's bill along with a graph that shows customer's current usage compared to the previous year.

For the last several years, the District has created a welcome package for all new customers including a Leak Detection Guide, the Demonstration Garden brochure and plant list, the Quarterly Newsletter, and the District's Water Conservation Calendar. Landscape Classes, Conservation Workshops, and Information booths at public events are done multiple times during the year. The District's outreach information, fliers, brochures and mailers are assembled in English and other languages.

WVWD regularly attends the regional Water Conservation Sub-Committee of the BTAC.

WVWD has partnered with other Inland Empire Water Agencies to develop a regional approach to conservation and messaging. The outreach campaign has helped implement the following:

- Collaborative communication effort with the other Inland Empire agencies participating, focused on ending water waste through outreach & education;
- Sharing information unique to the region through On-Hold messages, Mailers, Bill inserts, Lawn signs, Promotional items, Event participation, and Special outreach events;
- Using Press Conferences, Press Releases, Holding Statements, Fact Sheets, Targeted advertising, Presence on website and outreach materials, Participation in social media, and Regular live events.

10.8.1.5 Programs to Assess and Manage Distribution System Real

WVWD has policies for meter testing and replacement that were implemented in January 2011. WVWD now requires an annual testing of meters 4 inch and larger. The Meter Supervisor develops a schedule for testing that includes all meters that are 5 years or older. WVWD has a new valve maintenance crew to repair distribution system leaks. All new fire hydrants installed are equipped with internal check valves so water loss is minimized if a fire hydrant gets hit. WVWD has a full time maintenance and meter department that repairs leaks that are reported by customers or personnel, on a priority basis. The total budget for these departments for FY 2020-2021 is 3.3 million dollars. WVWD repairs approximately 30 leaks a month. The Billing Department Staff also notifies customers, using their monthly meter readings; if it looks like the consumption has increased significantly. Customer Service Staff also provides a letter of thanks to customers for reporting leaks.

10.8.1.6 Water Conservation Program Coordination and Staffing Support

WVWD's Water Conservation Program is a district wide effort. Staff from Customer Service, External Affairs, GIS, Meters, Operations, Engineering and other departments collaborate on various aspects of the program, on encouraging conservation and on ways to efficiently and wisely use our water resources.

The Board of Directors of WVWD adopted Ordinance No. 80, Amending Article No. 24 Water Conservation, of the Service Rules and Regulations. The adoption of this ordinance allowed the District to create a Stage III, A, B & C to be able to restrict the number of irrigation days allowed by Board action instead of ordinance adoption. This Ordinance also addressed the changes required by the State Water Resources Control Board on May 5, 2015.

10.8.1.7 Other Demand Management Measures

WVWD has a number of rebate programs in place to incentivize customers to upgrade to more water efficient technology. Some of WVWD's rebate programs offered are listed below:

- Residential Plumbing Retrofit Kits - package to customers that includes 2 low flow showerheads, 1 kitchen faucet aerator, and 2 bathroom faucet aerators. WVWD plans to expand these kits to include new innovative water conserving features.
- Residential ULFT/HET Rebates - Up to $100 rebate per household.
- Residential HEW Rebates - Up to $100 rebate per household.
- Residential WBIC Rebates - Up to $100 rebate per household.
- Residential HE Nozzles Rebates - Up to $4 per nozzle rebate.
- Residential Turf Replacement Rebates.
- Institutional Rebate Programs - rebate program targeted at schools within WVWD's boundaries to offer rebates on an individual basis for toilets and ET controllers for landscaping.
- CII Rebate Programs - WVWD identifies high water users and will work with each company on an individual basis to create a conservation program tailored to their particular needs.

- Disadvantaged Community (DAC) Water/Energy Grant Program - Starting 2016, remove 65,000 square feet of residential turf and replace it with drought tolerant landscaping. Annually, Water Savings of 44 gallons per square foot.

WVWD is developing two additional online applications. One which will allow customers to submit an online form to request rebates via WVWD's website and another for the turf replacement rebate program. The District offers incentives for customers who replace their high water-consuming landscaping with drought tolerant landscaping.

10.8.2 Implementation over the Past Five Years

WVWD's current per-capita consumption is less than its 2020 compliance target, largely due to the conservation programs and messaging employed by WVWD. WVWD expects to continue to implement its current conservation programs to encourage conservation and maintain per-capita consumption below the compliance target.

10.9 Adoption, Submittal and Implementation

This section describes WVWD's process for adopting, submitting, and implementing the 2020 IRUWMP and WVWD's WSCP.

10.9.1 Notice of Public Hearing

A joint notice was provided on behalf of all agencies whose 2020 UWMPs are part of the 2020 IRWUMP to all cities and counties and other stakeholders within the region that that 2020 IRUWMP is being prepared. This notice was sent at least 60 days prior to WVWD's public hearing. The recipients are identified in **Part 1 Chapter 1** and include all cities and counties within WVWD's service area. A second notice was provided to these cities and counties with the date and time of the public hearing and the location where the draft report was available for review.

> WVWD provided notice to the public through its website and published announcements of the public hearing in a newspaper on two occasions before the hearing. Copies of the proof of publication are included in Part 4 Appendix J-2.

10.9.2 Public Hearing and Adoption

WVWD held a public hearing on June 17, 2021 to hear public comment and consider adopting this 2020 IRUWMP and WVWD's WSCP.

As part of the public hearing, the WVWD provided information on their baseline values, water use targets, and implementation plan required in the Water Conservation Act of 2009. The public hearing on the 2020 IRUWMP took place before the adoption of the Plan, which allowed WVWD the opportunity to modify the 2020 IRUWMP in response to any public input before adoption. After the hearing, the Plan was adopted as prepared or as modified after the hearing.

WVWD's adoption resolution for the 2020 IRUWMP and WVWD's WSCP is included in Part 4 Appendix J-3.

10.9.3 Plan Submittal

WVWD will submit the 2020 IRUWMP and WVWD's WSCP to DWR, the State Library, and cities and counties within 30 days after adoption.

2020 IRUWMP submittal to DWR will be done electronically through WUEdata, an online submittal tool.

10.9.4 Public Availability

No later than 30 days after filing a copy of its Plan with DWR, WVWD will make the plan available for public review during normal business hours by placing a copy of the 2020 IRUWMP and WVWD's WSCP by posting the plans on the District's website for public viewing.

10.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan

If the adopted 2020 IRUWMP or WVWD's WSCP is amended, each of the steps for notification, public hearing, adoption, and submittal will also be followed for the amended plan.

YUCAIPA VALLEY WATER DISTIRCT

2020 IRUWMP

Part 2 Chapter 11 Yucaipa Valley Water District 2020 UWMP

JUNE 30, 2021

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

11

RETAIL URBAN WATER MANAGEMENT PLAN

Yucaipa Valley Water District

This chapter describes information specific to Yucaipa Valley Water District, its supplies, demands and water use efficiency programs. The information and analysis in this chapter is supplemental to the regional information presented in Part 1 of the 2020 IRUWMP and is provided to meet the Yucaipa Valley Water District's reporting requirements for 2020 under the UWMP Act.[1]

The Yucaipa Valley Water District (YVWD or District) service area covers approximately 40 square miles and serves water to a population of 51,558 people. Most of the water use within its service area is for single family and multi-family residential use but also includes some commercial, irrigation, and institutional use. YVWD utilizes groundwater, local surface water, imported water, and recycled water to meet the customer demands. Because of its continued recharge efforts and the increasing use of recycled water, YVWD anticipates success in meeting the needs of its population in the future even as the population continues to grow and the likelihood of severe droughts persist.

IN THIS SECTION

1 This chapter was prepared by Yucaipa Valley Water District staff.

11.1 Introduction

YVWD was formed as part of a reorganization, pursuant to the Reorganization Act of 1965, being Division I of Title 6 of the Government Code of the State of California. This reorganization consisted of the dissolution of the Calimesa Water Company and formation of Improvement District No. 1 of YVWD as successor-in-interest thereto, and the dissolution of Improvement District "A" of the San Bernardino Valley Municipal Water District and the formation of Improvement District "A" of YVWD as successor-in-interest thereto. On September 14, 1971, the Secretary of State of the State of California certified and declared the formation of the District.

YVWD operates under the County Water District Law, being Division 12 of the State of California Water Code. Although the immediate function of the District at the time was to provide water service, YVWD currently provides a variety of services to residential, commercial and industrial customers. These services include potable water service, drinking water treatment, recycled water service, sewer collection, sewer treatment and salinity elimination.

Table 11-1. DWR Table 2-1: Public Water System

Submittal Table 2-1 Retail Only: Public Water Systems			
Public Water System Number	Public Water System Name	Number of Municipal Connections 2020	Volume of Water Supplied 2020 *
CA3610055	Yucaipa Valley Water District	13,582	11,345
TOTAL		13,582	11,345
* Units of measure - AF			

11.2 Plan Preparation

Yucaipa Valley Water District has collaborated with the retailers within the San Bernardino Valley Municipal Water District to prepare the 2020 Urban Water Management Plan (UWMP) while also integrating the Integrated Regional Waters Management Plan (IRWMP), collectively the Upper Santa Ana River Watershed Integrated Regional Urban Water Management Plan (IRUWMP).

Table 11-2. DWR Table 2-2: Plan Identification

Submittal Table 2-2: Plan Identification			
Select Only One	Type of Plan		**Name of RUWMP or Regional Alliance** if applicable (select from drop down list)
☐	Individual UWMP		
	☐	Water Supplier is also a member of a RUWMP	
	☐	Water Supplier is also a member of a Regional Alliance	
☑	Regional Urban Water Management Plan (RUWMP)		2020 Upper Santa Ana River Watershed Integrated Regional Urban Water Management Plan

Table 11-3. DWR Table 2-3: Supplier Identification

Submittal Table 2-3: Supplier Identification	
Type of Supplier (select one or both)	
☐	Supplier is a wholesaler
☑	Supplier is a retailer
Fiscal or Calendar Year (select one)	
☑	UWMP Tables are in calendar years
☐	UWMP Tables are in fiscal years
Unit	AF
*** Units of measure (AF, CCF, MG)** must remain consistent throughout the UWMP as reported in Table 2-3.	
NOTES: Wholesale to Western Heights Mutual Water Company.	

Table 11-4. DWR Table 2-4: Retail: Water Supplier Information Exchange

Submittal Table 2-4 Retail: Water Supplier Information Exchange
The retail Supplier has informed the following wholesale supplier(s) of projected water use in accordance with Water Code Section 10631.
Wholesale Water Supplier Name
San Bernardino Valley Municipal Water District
San Gorgonio Pass Water Agency

Coordination with Other Agencies

As mentioned above, YVWD is part of the Regional IRUWMP for the 2020 UWMP and IRWMP. On March 10, 2021 YVWD distributed a 60-day notice to additional partner agencies notifying each agency that YVWD will be reviewing the plan and considering amendments or changes to the plan. The notices were sent to Riverside and San Bernardino Counties along with several cities, agencies and associations.

11.3 System Description

YVWD is located in the upper portion of the Santa Ana Watershed approximately 40 miles west of Palm Springs, 70 miles east of Los Angeles, and 120 miles north of San Diego in a high elevation valley at the base of the San Bernardino Mountain Range. YVWD's primary service area ranges in elevation from a low elevation of 2,044 feet above sea level to a high elevation of 5,184 feet above sea level. The range in elevation of 3,140 feet within the District requires YVWD to provide water service from 18 separate pressure zones.

YVWD's current service area encompasses approximately 25,742 acres, or 40 square miles which include the City of Calimesa and the City of Yucaipa. Neighboring cities include the City of Redlands and the City of Beaumont. YVWD's sphere of influence expands the acreage to 43,525 acres, or 68 square miles.

The YVWD service area includes two mutual water companies the Western Heights Water Company and the South Mesa Water Company. The service area of the Western Heights Mutual Water Company is 4.53 square miles (2,902 acres) and the service area of the South Mesa Mutual Water Company is 4.00 square miles (2,561 acres). In the future, the population of Western Heights Mutual Water Company and South Mesa Water Company are expected to have limited growth as compared to the larger service area boundary of YVWD.

11.3.1 General Description

YVWD serves drinking water, wastewater and recycled water to its customers. YVWD serves approximately 14,440 drinking water connections through 234 miles of pipeline. There are 14,363 sewer connections and 695 recycled water connections. The sewer has 8.0 million gallons of capacity and the collection system extends 222 miles throughout YVWD's service area. YVWD's recycled water system continues to expand and currently serves 0.623 billion gallons of recycled water annually. Over 0.595 billion gallons of brine is discharged to the Inland Empire Brine Line which is then further treated and disposed of at the Orange County Sanitation District. The YVWD service area shown in Figure 11-1 and Figure 11-2 shown below, is different than the water system boundary shown in Figure 11-3 because YVWD is the wastewater provider for Western Heights and South Mesa Water Companies, but does not serve potable water to those areas.

Figure 11-1. Yucaipa Valley Water District Service Area boundary (blue) and Sphere of Influence (red)

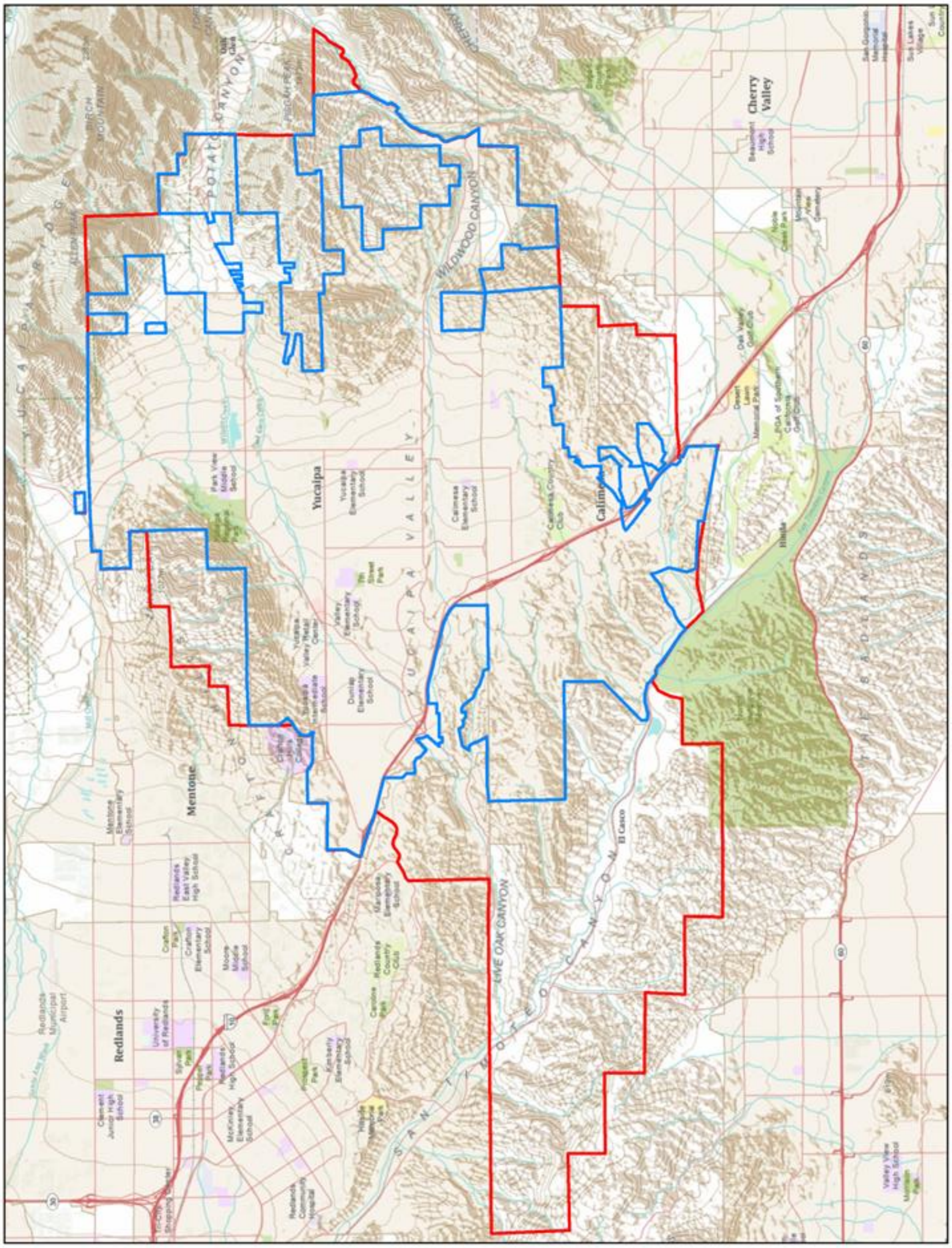


Figure 11-2. Yucaipa Valley Water District Service Area

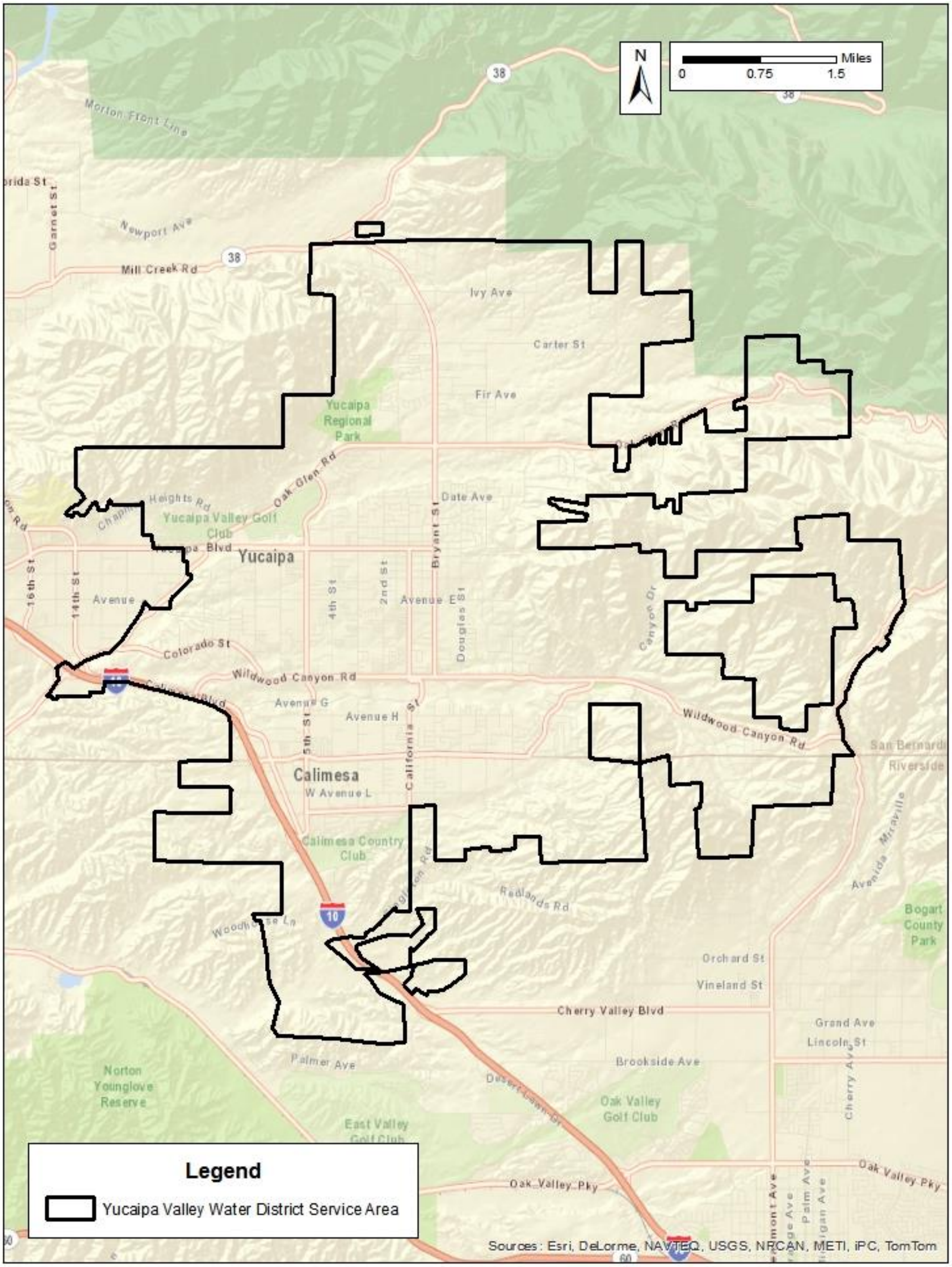
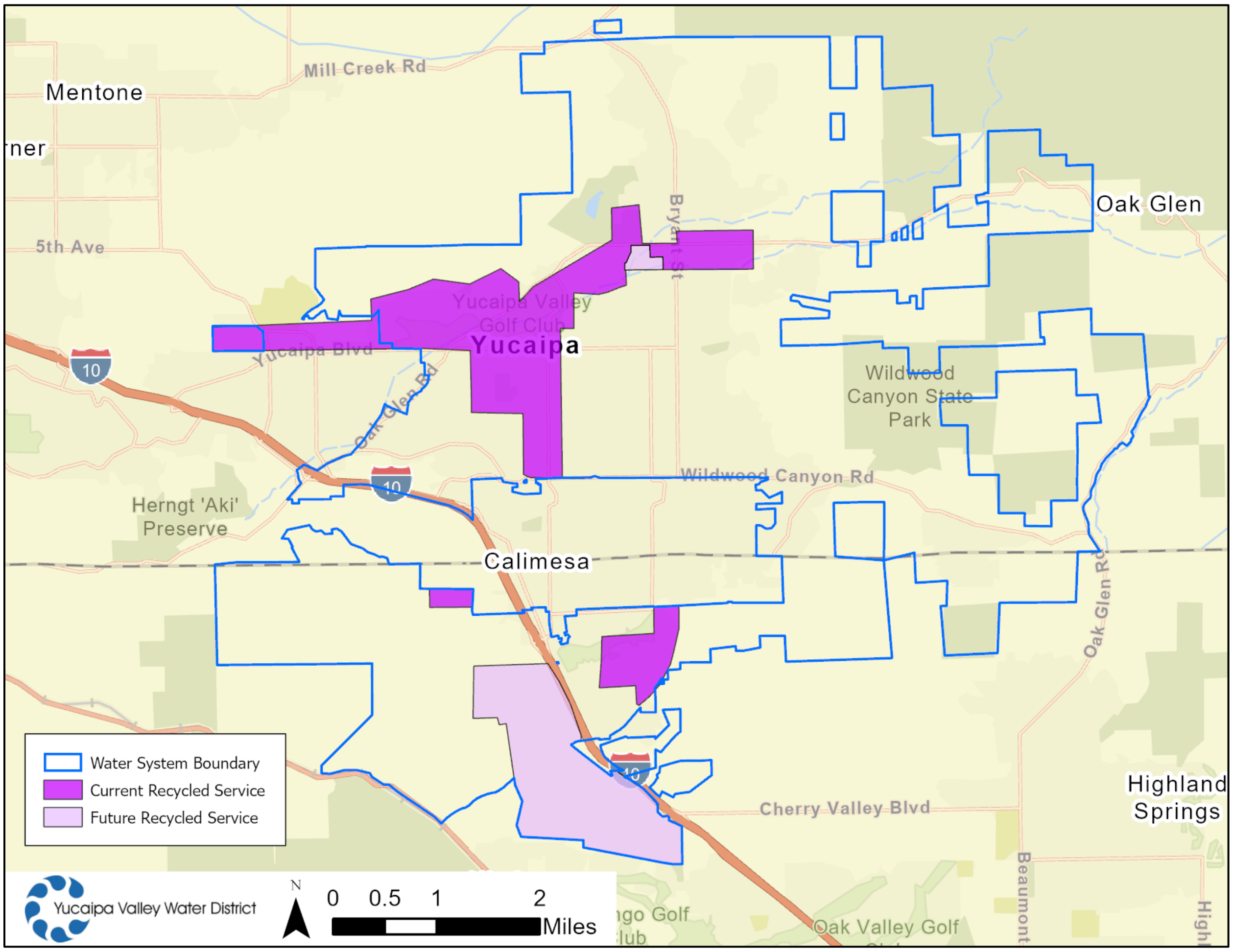


Figure 11-3. Yucaipa Valley Water District potable and recycled water system boundaries



11.3.2 Service Area Climate

YVWD is located in the upper portion of the Santa Ana Watershed within the South Coast Hydrologic Region. Temperatures range from an average high of 78º and an average low of 49º. The record high for the area is 117º and the record low is 17º.

The annual average rainfall for the area is about 15.80 inches per year. The climate is characterized by hot dry summers when temperatures can rise above 100°, and moderate winters, with rare freezing temperatures. A major portion of the precipitation occurs between December and March. Snow in the upper reaches of the area is possible but is not considered an important contributing factor to runoff.

Average temperature, precipitation, and evapotranspiration by month are shown in YVWD Table 11-5. Evapotranspiration (ET) is the loss water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues). It is an indicator of how much water crops, lawn, garden, and trees need for healthy growth and productivity. ET from a standardized grass surface is commonly denoted as ETo. These data are based on 30 years of record (1986-2015) at Station 044 (University of California Riverside) within the California Irrigation Management Information System (CIMIS).

As noted below, YVWD is located inland and experiences hot, dry summers and mild winters. Climate change has the potential to impact temperatures for the region, therefore it is important to plan for weather extremes when forecasting water reliability. In addition, the 2020 UWMP requires retailers to analyze potential climate change impacts. Impacts to climate change on supplies and reliability are further addressed in Section 4, 6 and 7.

Table 11-5. Average climatic data for NOAA weather station 0407723

MONTH	AVERAGE MINIMUM TEMPERATURE (°F)	AVERAGE MAXIMUM TEMPERATURE (°F)	AVERAGE PRECIPITATION (IN.)	AVERAGE STANDARD ETO (IN.)
January	39.3	64.7	2.67	3.32
February	41.3	66.1	2.65	2.41
March	43.6	69.1	2.31	4.62
April	46.8	73.7	1.18	5.58
May	51.1	78.5	0.48	6.32
June	55.2	86.7	0.11	5.37
July	60.3	94.5	0.06	7.60
August	60.6	94.2	0.15	6.68
September	57.5	90.0	0.29	5.89
October	51.2	81.0	0.70	4.40
November	44.0	72.6	1.14	3.18
December	39.6	65.9	1.79	2.08
Annual	49.2	78.1	13.53	57.45

Notes: Precipitation and temperature for NOAA weather station 0407723 in San Bernardino; data from 1893 through 2004; http://wrcc.dri.edu; ETo data for CIMIS weather station 44 at University of California, Riverside; http://wwwcimis.water.ca.gov/

11.3.3 Service Area Population and Demographics

YVWD has experienced significant growth in the last 20 years as with many areas in San Bernardino and Riverside County. Within the last 5 years Yucaipa and Calimesa's growth has slowly increased due to overall economic conditions across the United States. The estimated service area populations are shown in Table 11-6 for the existing service area of YVWD.

11.3.3.1 Service Area Population

To calculate the population that YVWD serves water to, the YVWD water system boundary in Figure 1c was used with census data to provide population estimates for 2000 and 2010. Population for intermediate non-census years was estimated using an anticipated growth rates based on future development projections. The service area population for 2020 was estimated using the number of water connections multiplied by number of people per household. The estimated population of Western Heights Mutual Water Company and South Mesa Mutual Water Company are not included in these calculations. A more detailed method of the 2020 population calculation is explained in Section 11.

Table 11-6. DWR Table 3-1: Retail: Population - Current and Projected

Submittal Table 3-1 Retail: Population - Current and Projected						
Population Served	2020	2025	2030	2035	2040	2045(opt)
	51,558	53,779	56,429	59,079	61,729	64,379

11.3.3.2 Other Social, Economic and Demographic Factors

YVWD categorizes its water customers based on the following categories (the percentages represent the proportionality of service connections as of March 31, 2021.

- Single Family Residential - 91.6%
- Multi-Family Residential - 3.51%
- Commercial - 1.79 %
- Irrigation Potable - 0.88%
- Institutional - 0.56%
- Irrigation - Recycled Water - 0.55%
- Construction Water - 0.17%
- Fire Service - 0.13%
- Industrial - 0.07%

11.3.4 Land Uses within Service Area

YVWD coordinates with local cities and counties regarding land use trends for the area. The YVWD boundary partially covers two cities, two counties, and two mutual water districts. This overlap requires extensive collaboration through various monthly meetings. Coordination with the localized land use authorities, Calimesa and Yucaipa, provide YVWD with detailed information on development project applications, redevelopment initiatives, and other information available to the local land use authority. YVWD Board members and staff actively engage in the various public meetings in the region in order to stay apprised of the land use trends.

The YVWD boundary encompass a variety of residential communities from large lot homes in the north and east portion of the district and smaller tract homes and mobile homes in the center of Yucaipa and Calimesa. Commercial development is present with commercial growth continuing the west side of the district and many portions in Calimesa. YVWD also has a large amount of open space and agriculture with the Crafton Hills and portions of Oak Glen and Wildwood State Park.

11.4 Water Use Characterization

YVWD utilizes groundwater, local surface water, state water project water and recycled water to meet the customer demands. Further discussion regarding YVWD's future water use based on past and current water use, combined with considerations of anticipated growth, new regulations, changing climate conditions, and trends in customer water use behaviors is included in this section. Each water use sector is evaluated in order to formulate the most accurate projections for YVWD's service area.

11.4.1 Non-Potable Versus Potable Water Use

YVWD does not supply non-potable water in the distribution system. The water supplied through the service area include potable water and recycled water. Recycled water use can be found in Table 11-18.

Demands for potable water in 2020 are shown in Table 11-7.

Table 11-7. DWR Table 4-1: Retail: Demands for Potable and Non-Potable Water – Actual

Submittal Table 4-1 Retail: Demands for Potable and Non-Potable Water - Actual			
Use Type	2020 Actual		
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	Level of Treatment When Delivered Drop down list	Volume (AF)
Sales/Transfers/Exchanges to other Suppliers	Western Heights	Drinking Water	460
Multi-Family		Drinking Water	1,141
Single Family		Drinking Water	8,483
Commercial		Drinking Water	285
Landscape		Drinking Water	291
Industrial		Drinking Water	36
Institutional/Governmental		Drinking Water	332
Other	Fire Service	Drinking Water	1
Other	Construction Water	Drinking Water	34
Losses	All non-revenue water	Drinking Water	281
TOTAL			11,345

11.4.2 Past, Current, and Projected Water Use by Sector

YVWD's past water use from 2016 – 2019 is illustrated in the table below.

11.4.2.1 Distribution System Water Loss

YVWD was a member of the California Urban Water Conservation Council for several years. The AWWA water loss audit forms were submitted annually since 2010. Information on past water loss reports can be found in Table 11-10 below. YVWD has incorporated improvements to water loss following each water audit. For example, the district implements a leak detection program each year. In addition, meter testing and calibration has been incorporated on a regular basis in order to define meter inaccuracies.

YVWD is committed to managing system water losses to reduce water waste and will endeavor to meet the future water loss performance standards that is being developed by the State Water Resources Control Board.

Nonrevenue water identified by YVWD

- Customer Meter Inaccuracies - Customer meters represent one of the main sources of nonrevenue water as they tend to under-represent actual consumption in the water system. YVWD has a replacement program to replace all district meters to AMI meters in order to reduce meter inaccuracies.
- Storage Reservoir overflows - This represents unrecorded water use when reservoirs overflow.
- Leaks from water lines - Leakage from water pipes is a common occurrence in water systems. A significant number of leaks remain undetected over long periods of time as they are very small; however, these small leaks contribute to the overall nonrevenue water.

11.4.2.2 Current Water Use

Current water use and level of treatment of the water supply is defined in Table 11-7 above. A total of 11,345 AF of water was consumed in 2020.

11.4.2.3 Projected Water Use

YVWD calculates water use projections by calculating actual 2020 water use and projecting planned development projects estimates to extrapolate annual projections to 2045. For the 2020 UWMP, water use projections also considered codes, ordinances and land use plans in order to refine the estimates.

The following resolutions and ordinances represent YVWD standards and land-use plan considerations to the projections of future water demands.

Resolution No. 11-2008 – A Strategic Plan for a Sustainable Future. The Strategic plan makes known the uncertainty, unreliability and unpredictable nature of imported water supplies while providing a route for navigating the future to protect the interests of current and future customers.

Ordinance 58-2018 – Adopting New Rules and Regulations for Recycled Water Use and Distribution – YVWD utilizes local water supplies and imported water for domestic, agricultural and industrial uses. The development and utilization of recycled water results in a direct reduction in the amount of imported water needed by the District. The recycled water program has multiple benefits which include the conservation of groundwater and surface water that would otherwise be used for recycled irrigation use; provides YVWD with a reliable and drought-proof water supply source; and provides an alternative to wastewater discharge into tributaries of the Sana Ana River.

Ordinance 60-2019 – New Water Conservation Rules and Regulations to Reduce Water Shortage and Water Waste – YVWD adopted an updated Water Conservation Ordinance with the goal of conserving groundwater and surface waters; establishing clear water conservation measures for customers; and aligns with recently passed State legislation and supports the concepts presented in Making Water Conservation a California Way of Life.

Table 11-8. DWR Table 4-2: Retail: Use for Potable and Non-Potable Water – Projected

Submittal Table 4-2 Retail: Use for Potable and Non-Potable Water - Projected						
Use Type		Projected Water Use* *Report To the Extent that Records are Available*				
Drop down list May select each use multiple times These are the only Use Types that will be recognized by the WUEdata online submittal tool	Additional Description (as needed)	2025	2030	2035	2040	2045 (opt)
Single Family		8,018	7,537	7,085	6,660	6,260
Multi-Family		1,068	1,004	944	887	834
Commercial		264	248	233	219	206
Other	Construction Water	32	30	28	27	25
Industrial		34	32	30	28	26
Institutional/Governmental		297	279	262	246	232
Landscape		274	258	242	228	214
Sales/Transfers/Exchanges to other Suppliers	Western Heights	2,000	2,000	2,000	2,000	2,000
Losses	non-revenue water	671	638	606	577	549
TOTAL		12,658	12,026	11,430	10,872	10,346
*Acre Feet						

Table 11-9. DWR Table 4-3: Retail: Total Water Use (Potable and Non-Potable)

Submittal Table 4-3 Retail: Total Water Use (Potable and Non-Potable)						
	2020	2025	2030	2035	2040	2045 (opt)
Potable Water, Raw, Other Non-potable *From Tables 4-1R and 4-2 R*	11,345	12,658	12,026	11,430	10,872	10,346
Recycled Water Demand *From Table 6-4*	1,374	3,630	3,800	4,000	4,200	4,400
Optional Deduction of Recycled Water Put Into Long-Term Storage						
TOTAL WATER USE	12,718	16,288	15,826	15,430	15,072	14,746

Distribution System Water Loss

YVWD has an active water loss control program and has performed a water loss audit using the AWWA Manual 36 for calendar year 2019. The 2019 AWWA Water Audit Reporting Worksheet is included as Part 4 Appendix K-8.

Based on the results of the 2019 Distribution System Water Loss report, the YVWD has implemented a refinement of this program to involve additional staff members to participate in the compilation of the report so there is a better understanding of water losses to improve the efficiency and effectiveness of the operations.

The AWWA water audit methodology has been performed annually in preparation of the 2020 UWMP document that requires reporting information for 2016, 2017, 2018, and 2019.

Table 11-10. DWR Table 4-4: Retail: Last Five Years of Water Loss Audit Reporting

Submittal Table 4-4 Retail: Last Five Years of Water Loss Audit Reporting	
Reporting Period Start Date	Volume of Water Loss [1,2]
01/2015	580
01/2016	916
01/2017	316.77
01/2018	1,532.595
01/2019	507.501
[1] Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet. [2]Units of measure AF	

11.4.3 Water Use for Lower Income Households

Senate Bill 1087 requires that water use projections of an UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier.

YVWD reviewed the most recent General Plan the City of Yucaipa and the City of Calimesa for each of these entities to determine the percentage of households that are lower income (less than 80 percent of the median household income). YVWD estimated a weighted average of 15 percent of households in the service area are lower income. In the absence of more detailed information, YVWD estimated that this percentage applies to its single-family residential and multi-family residential water use across the service area. These demands are included in the projections presented throughout this report.

YVWD will not deny or put unreasonable conditions for water services or reduce the number of services applied for by a proposed development that includes housing units affordable to lower income households unless one of the following occurs. The conditions below apply to all applicants and developers: YVWD specifically finds that it does not have sufficient water supply, YVWD is subject to a compliance order issued by the State that prohibits new water connections or the applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

11.4.4 Drought Risk Assessment – Climate Change

California droughts are expected to increase due to climate change. California's Fourth Climate Change Assessment's Statewide Summary Report states the 2012-2016 drought provided a strong example of how recent episodes of unusually warm temperatures and low snowpack can diminish water availability to California's water conveyance system which supply a portion of water to Southern California water retailers. YVWD relies on a portion of imported water. This source of water supply can be more difficult to rely on due to the expectations of climate change impacts. YVWD has recharged an additional 28,783 acre feet of water into the Wilson Creek Basins in order to prepare for future drought due to climate change. YVWD has been addressing climate change by ensuring local supplies are robust and reliable for future demands. Purchasing additional State Water Project Water during wet cycles and recharging the surplus water into local groundwater basins has increased the groundwater levels in the Yucaipa Basin over 100 feet. In addition, the expansion of the recycled water program will also provide a drought proof source of water for recycled water users.

11.4.5 Estimating Future Water Savings

YVWD is committed to long-range planning to provide a reliable, cost-effective, and diversified water supply to its customers. YVWD actively monitors water consumption in its service area as part of their active planning and management strategies. Portions of the information collected by YVWD are included in the monthly reports sent to the State Water Resources Control Board.

For this report, YVWD has projected that future demands will increase at different growth rates applied to each decade together with the following factors:

- The percentage growth in service area population based on projections for each decade to 2070;
- The variations associated with imported water availability for the San Bernardino Valley Municipal Water District (for potable water service to the City of Yucaipa) and the San Gorgonio Pass Water Agency (for potable water service to the City of Calimesa);
- Anticipated reductions to the current per-capita consumption for the reporting period;
- Active construction of recycled water infrastructure for dual-plumed residential developments; and
- Projections for each type of customer classification served by YVWD.

Water suppliers have the option of preparing more detailed demand forecasts by estimating demand factors based on land use categories. For example, YVWD could identify typical water use per single family customer and per commercial account. These customer classes can be further sub-divided by lot size, neighborhood, or other variables. The intent is to quantify the estimated water use per customer in different customer classes, and then to forecast how future changes will impact water use within each customer class. This will be done by participating in the Landscape Area Measurement Project required by the Department of Water Resources.

Recent drought regulations have introduced significant changes in water consumption patterns, and there is considerable uncertainty as to how demands will change in the future if the drought subsides. However, YVWD has quantified passive savings for this UWMP. Even as the population continues to grow, YVWD does expect to see an overall decrease in potable water use due to conservation and increase recycled use.

Table 11-11. DWR Table 4-5: Retail: Inclusion in Water Use Projections

Submittal Table 4-5 Retail Only: Inclusion in Water Use Projections	
Are Future Water Savings Included in Projections? (Refer to Appendix K of UWMP Guidebook) *Drop down list (y/n)*	Yes
If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, or otherwise are utilized in demand projections are found.	Section 4.2.6
Are Lower Income Residential Demands Included In Projections? *Drop down list (y/n)*	Yes

11.5 SB X7-7 Baselines and Targets and 2020 Compliance

An urban retail water supplier was required to set a 2020 water use target (herein called the Compliance Water Use Target). YVWD had previously calculated baseline water use and water use targets in the 2015 RUWMP using 2010 census data in the calculation of service area, but is recalculating the baseline due to an error in the original calculation. The error was due to including a portion of the YVWD service area that receives sewer service from YVWD, but water service from another retailer. Including this part of the service area in the calculation artificially decreased YVWD's baseline and target GPCD. Once the error was recognized, YVWD staff confirmed with Gwen Huff of DWR that a recalculation of the baseline and target GPCD was necessary. The SB X7-7 Verification Form was recompleted and is included in this Plan.

11.5.1 Baseline Water Use Calculation

Years 2000 to 2009 have been selected for calculation of the 10-year base period, while years 2005 to 2009 have been selected for the calculation of the 5-year base period.

Historical population for the baseline periods was calculated by using the DWR population tool.

The calculation of gross water use begins with the total amount of water that was put into the potable water distribution system by YVWD. Water that was exported to another agency was then subtracted to leave the amount used by YVWD retail customers.

For the period from 2000 through 2009, the 10-year average Base Daily Per Capita Water Use for YVWD is 286 GPCD; the 5-year is 279 GPCD.

11.5.2 Water Use Targets

The Water Conservation Bill of 2009 (SBX7-7) is one of four policy bills enacted as part of the November 2009 Comprehensive Water Package (Special Session Policy Bills and Bond

Summary). The Water Conservation Bill of 2009 provides the regulatory framework to support the statewide reduction in urban per capita water use described in the 20 by 2020 Water Conservation Plan. Consistent with SBX7-7, each water supplier must determine and report its existing baseline water consumption and establish future water use targets in gallons per capita per day (GPCD); reporting began with the 2010 UWMP.

An urban retail water supplier was required to set a 2020 water use target (herein called the Compliance Water Use Target) and a 2015 interim target (herein called the Interim Water Use Target). There are four methods for calculating the Compliance Water Use Target:

1. Eighty percent of the urban water supplier's baseline per capita daily water use
2. Per capita daily water use estimated using the sum of the following:
    a) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of DWR's 2016 report to the Legislature reviewing progress toward achieving the statewide 20 percent reduction target, this standard may be adjusted by the Legislature by statute.
    b) For landscape irrigated through dedicated or residential meters or connections, water use efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in section 490 et seq. of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992.
    c) For commercial, industrial, and institutional (CII) uses, a ten percent reduction in water use from the baseline CII water use by 2020.
3. Ninety-five percent of the applicable state hydrologic region target as stated in the state's April 30, 2009, draft 20 by 2020 Water Conservation Plan. YVWD falls within the South Coast Hydrologic Region; the region target is 142 GPCD. The South Coast region encompasses several coastal counties (Ventura, Los Angeles, Orange, and San Diego) and includes portions of inland areas such as San Bernardino and Riverside. This target is more appropriate for coastal, rather than inland, areas.
4. Reduce the 10 or 15-year Base Daily Per Capita Water Use a specific amount for different water sectors:
    a) Indoor residential water use to be reduced by 15 GPCD or an amount determined by use of DWR's "BMP Calculator".
    b) A 20 percent savings on all unmetered uses.
    c) A 10 percent savings on baseline CII use.
    d) A 21.6 percent savings on current landscape and water loss uses.

The Interim Water Use Target, the target for 2015, is set as a halfway point between the Base Daily Water Use GPCD and the 2020 Compliance Water Use Target GPCD.

In addition to calculating base gross water use, SBX7-7 requires that a retail water supplier identify its demand reduction targets. YVWD chose to meet SBX7-7 targets as an individual agency rather than as part of a regional alliance. YVWD also selected Method 1 to calculate its 2020 Compliance Water Use Target and Interim Water Use Target.

Table 11-12. DWR Table 5-1: Baselines and Targets Summary From SB X7-7 Verification Form

<table>
<tr><td colspan="5">Submittal Table 5-1 Baselines and Targets Summary From SB X7-7 Verification Form
Retail Supplier or Regional Alliance Only</td></tr>
<tr><td>Baseline Period</td><td>Start Year*</td><td>End Year *</td><td>Average Baseline GPCD*</td><td>Confirmed 2020 Target*</td></tr>
<tr><td>10-15 year</td><td>2000</td><td>2009</td><td>286</td><td rowspan="2">229</td></tr>
<tr><td>5 Year</td><td>2005</td><td>2009</td><td>279</td></tr>
<tr><td colspan="5">*All cells in this table should be populated manually from the supplier's SBX7-7 Verification Form and reported in Gallons per Capita per Day (GPCD)</td></tr>
<tr><td colspan="5">NOTES: YVWD adjusted the 2020 Target GPCD due to adjustment to the District boundaries. The 2015 GPCD had inadvertently included population that was within YVWD’s service area but sewer service only therefore the population should have not been included in the GPCD calculations for 2015.</td></tr>
</table>

Compliance Water Use Target under Method 1 is eighty percent of the water supplier’s baseline per capita water use. The resulting Compliance Water Use Target is 229 GPCD, the interim Water Use Target is 258 GPCD. This GPCD target has been adjusted in the 2020 UWMP due to the recalculation of the population data.

11.5.3 2020 Compliance Daily Per-Capita Water Use (GPCD)

2020 Population Estimate

To estimate the 2020 population in the YVWD service area, the number of single and multi-family service connections was used to determine the number of dwelling units. The dwelling unit numbers were then multiplied by the Persons per Household by City number that is found on the Census website (www.census.gov/quickfacts/yucaipacitycalifornia and www.census.gov/quickfacts/calimesacitycalifornia).

Table 11-13. 2020 Population Calculation Method

CITY	YVWD SINGLE FAMILY CONNECTIONS	YVWD MULTI-FAMILY CONNECTIONS	MULTI-FAMILY DWELLING UNITS	TOTAL NUMBER OF DWELLING UNITS	PERSONS PER HOUSEHOLD BY CITY (2015-2019)	POPULATION SERVED
Yucaipa	10,558	475	5,147	15,705	2.92	45,859
Calimesa	1,979	6	124	2,103	2.71	5,699
Total:						51,558

This 2020 population estimate was similar but determined to be more accurate than the 2020 population estimate provided by the DWR Population Tool (49,561 people).

Adjustments

The El Dorado Fire that occurred in and around the YVWD service area from September 5, 2020 to November 16, 2020 caused an increase in water usage due to firefighting. The use was unmetered but can be estimated by comparing the water produced during those months in 2020 to the average water produced during those months for the previous three years.

Table 11-14. Adjustments Calculation Method

YEAR	WATER PRODUCED SEPTEMBER-NOVEMBER (AF)
Average 2016-2019	3065.7
2020	3193.0
Additional Water Produced in 2020:	127.3

An additional 127.3 AF of water was produced from September-November in 2020 which translates to about 2 GPCD.

Table 11-15. DWR Table 5-2: 2020 Compliance From SB X7-7 2020 Compliance Form

Submittal Table 5-2: 2020 Compliance from SB X7-7 2020 Compliance Form *Retail Supplier or Regional Alliance Only*				
2020 GPCD			2020 Confirmed Target GPCD*	Did Supplier Achieve Targeted Reduction for 2020? Y/N
Actual 2020 GPCD*	2020 TOTAL Adjustments*	Adjusted 2020 GPCD* (Adjusted if applicable)		
188	2	186	229	Y
*All cells in this table should be populated manually from the supplier's SBX7-7 2020 Compliance Form and reported in Gallons per Capita per Day (GPCD)				

YVWD has complied with its 2020 Confirmed Target GPCD and surpassed it by 43 GPCD.

11.6 Water Supply Characterization

11.6.1 Water Supply Analysis Overview

YVWD relies on three primary water resources to meet annual drinking water demands: groundwater resources, imported water resources, and local surface water resources. YVWD's drinking water supply consists primarily of groundwater pumped from 17 wells located throughout the YVWD service area. In 2020, these wells provide about 62.7 percent of the total drinking water supply. Imported water treated at the Yucaipa Valley Regional Water Filtration Facility (YVWRFF) provided 35.8 percent of the drinking water supply. Surface water treated at the Oak Glen Surface Water Treatment Plant provided the remaining 1.5 percent of the drinking water supply. In addition to the drinking water supplies, YVWD produces recycled water at the Wochholz Regional Water Recycling Facility (WRWRF). Also added to the recycled distribution system is the microfiltration backwash produced at YVWRFF. The combined volume from these two water sources produced enough recycled water to meet 16.5 percent of YVWD's total water demand in 2020, decreasing the potable water use by 2,234.48 AF.

11.6.2 Purchased or Imported Water

YVWD purchases imported water from two State Water Project contractors, the San Bernardino Valley Municipal Water District (SBVMWD) for the San Bernardino County portion of the service area, and the San Gorgonio Pass Water Agency (SGPWA), for the Riverside County portion of the service area. In 2000, imported water resources were not utilized to meet the water demands of the Yucaipa Valley Water District. By 2020, this resource supplied 35.8% of drinking water demands.

The two State Water Contractors convey purchased water which is utilized as a supplemental potable water source to the local supply and is treated at the Yucaipa Valley Regional Filtration Facility. The imported water is also used for groundwater recharge.

The SBVMWD has an entitlement to 102,600 AFY of SWP water that is used for both direct deliveries to treatment plants and artificial recharge of the Yucaipa groundwater basins. This water comes from the Sacramento San Joaquin Delta.

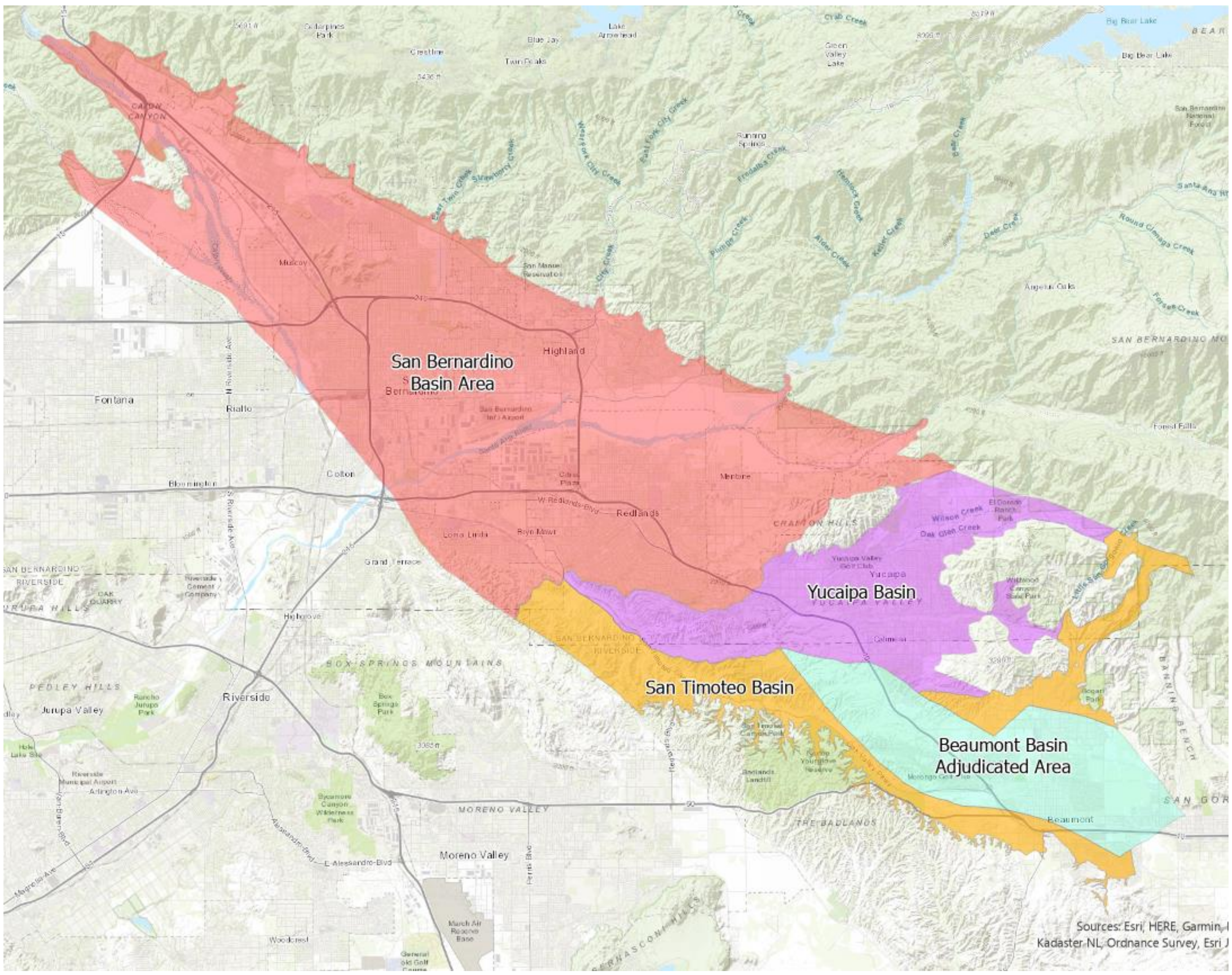
The SGPWA has an entitlement to 17,300 AFY of SWP water that is used for both direct deliveries to treatment plants and artificial recharge of the groundwater basins. SGPWA also purchases other available water to meet retailer demands.

There are no contracts between YVWD and the two wholesale agencies; however, each have resolutions that set forth the rates and rules for water sales and deliveries. SBVMWD's Resolution No. 888, titled "San Bernardino Valley Municipal Water District Rules, Regulations, and Rates for the Sale and Delivery of Water," became effective on January 1, 2003. SGPWA's Resolution No. 2019-03, titled "A Resolution of the San Gorgonio Pass Water Agency Adopting an Increased Rate for Wholesale Water Delivery," which became effective April 1, 2019.

11.6.3 Groundwater

YVWD has traditionally met the bulk of service area customer needs from groundwater using groundwater extraction wells. Since about 1970 and especially during the 1990's, the wide-spread urbanization of southern California has extended into the Yucaipa area. Undeveloped land, agricultural land, and sparsely populated residential land has been converted into tracts of single-family homes. The net effect of this change in land use has been an increase in the demand for water.

Figure 11-4. Map of the four basins: Yucaipa Basin, San Timoteo Basin, Beaumont Adjudicated Basin, and the San Bernardino Basin Area.

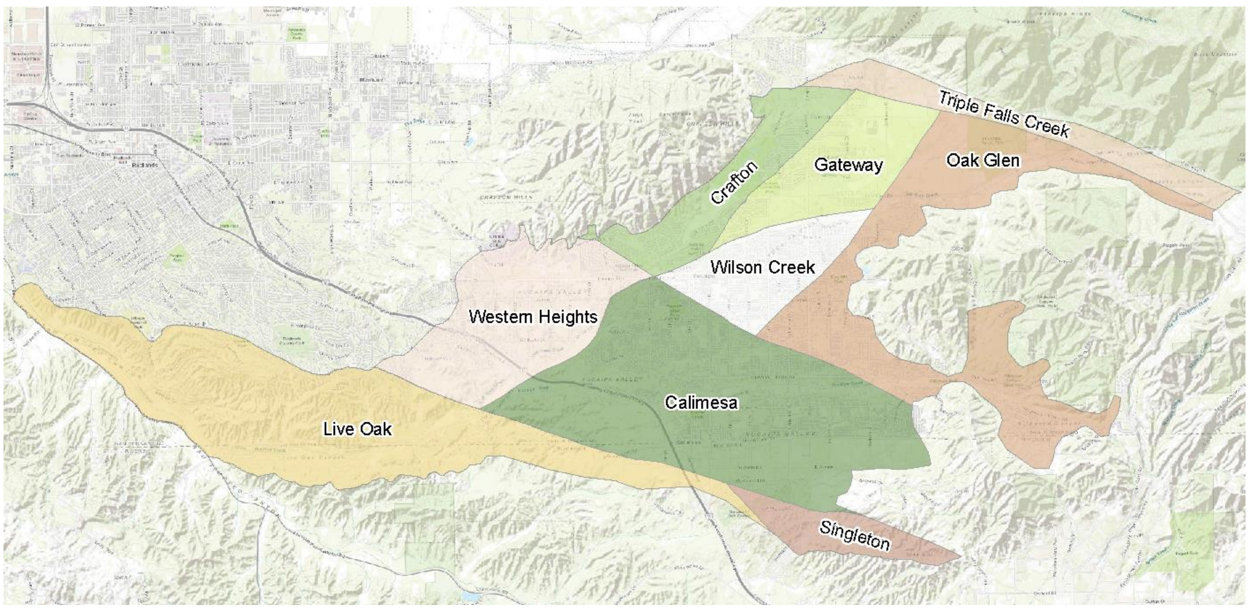


11.6.3.1 Yucaipa Groundwater Basin

In response to the Sustainable Groundwater Management Act (SGMA), the Yucaipa Sustainable Groundwater Management Agency (Yucaipa SGMA) was formed in 2017 by a Memorandum of Agreement between the following local water purveyors, municipalities, and regional water agencies: City of Redlands, City of Yucaipa, SBVMWD, SGPWA, South Mesa

Water Company, South Mountain Water Company, Western Heights Water Company, and YVWD. DWR identified the Yucaipa Basin as a high-priority basin; SGMA stipulates that a Groundwater Sustainability Plan (GSP) must be adopted by medium and high priority basins by 2022. Because of the several faults in the Yucaipa Basin it is further subdivided into several subbasins including the Calimesa, Crafton, Gateway, Live Oak, Oak Glen, Singleton, Triple Falls Creek, Western Heights, and Wilson Subbasins. The Yucaipa SGMA has a working draft GSP and is expecting to have a final draft completed by the end of 2021. The GSP will outline the sustainable yield of the basin that is divided into four Management Areas which have been based on a combination of the hydrogeology and location of purveyors' wells. Each Management Area will have individual sustainability criteria to monitor and avoid undesirable results.

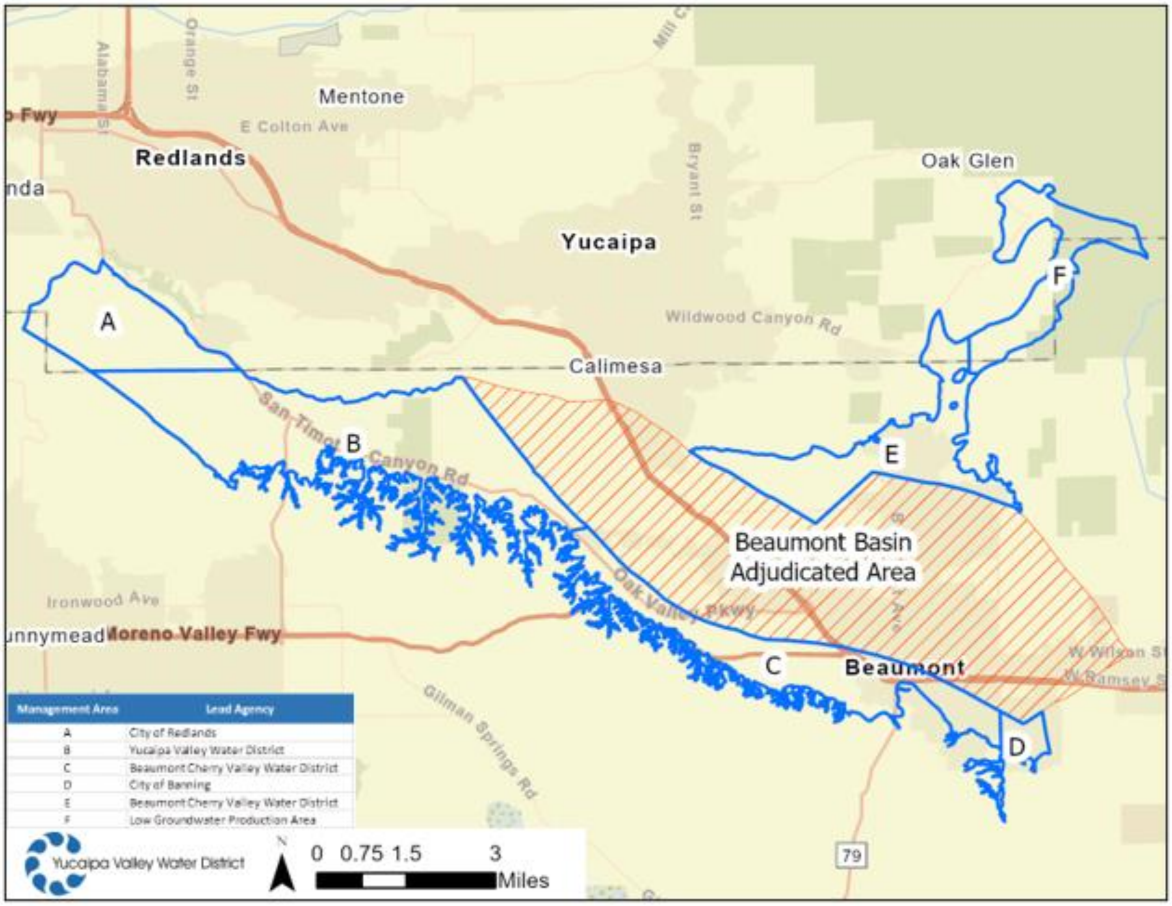
Figure 11-5. Map of the Yucaipa Basin



11.6.3.2 San Timoteo Groundwater Basin

San Timoteo Groundwater Sustainability Agency (GSA) is a low priority basin as reprioritized by the Department of Water Resources in 2019. The San Timoteo GSA is comprised of the City of Banning, Beaumont Cherry Valley Water District, City of Redlands and Yucaipa Valley Water District. It was agreed by the Parties of the San Timoteo GSA to establish Management Areas for the GSA for each agency's respective boundaries. Each agency agrees to work in good faith and coordinate all activities to carry out the purposes of the Memorandum of Agreement in implementing the policy, purposes, and requirements of SGMA within the boundaries of the San Timoteo GSA. The management areas are defined in the map below.

Figure 11-6. San Timoteo Groundwater Sustainability Agency Management Areas



Beaumont Adjudicated Basin

In February 2004 the San Timoteo Watershed Management Authority filed a judgment adjudicating the groundwater rights in the Beaumont Basin and assigned the Beaumont Basin Watermaster with the authority to manage the groundwater basin (Judgment Pursuant To Stipulation Adjudicating Groundwater Rights in the Beaumont Basin, 2004). The Beaumont Basin Watermaster is comprised of managers from the Beaumont Cherry Valley Water District, City of Banning, City of Beaumont, South Mesa Mutual Water Company, and Yucaipa Valley Water District. The adjudication of the Beaumont Basin has defined overlying and appropriator pumping rights and allows for supplemental water to be stored and recovered from the basin.

11.6.3.3 San Bernardino Basin

YVWD has one well located in the eastern most part of the Basin adjacent to the Yucaipa Basin. This well has produced an average of 135 AF per year from 2016 through 2020.

11.6.3.4 Past Five Years

YVWD's historical production for the past five years is shown in Table 11-16.

Table 11-16. DWR Table 6-1: Retail: Groundwater Volume Pumped

Submittal Table 6-1 Retail: Groundwater Volume Pumped						
☐	Supplier does not pump groundwater. The supplier will not complete the table below.					
☐	All or part of the groundwater described below is desalinated.					
Groundwater Type ***Drop Down List*** *May use each category multiple times*	Location or Basin Name	2016*	2017*	2018*	2019*	2020*
Alluvial Basin	Yucaipa Basin; 8-002.07	4,428.66	3,303.83	4,949.14	4,173.12	5,575.22
Alluvial Basin	Beaumont Adjudicated Basin	4.58	0.12	191.2	528.63	1,407.72
Alluvial Basin	Yupper Santa Ana Valley; 8-002.06; Bunker Hill, San Bernardino Basin	161.62	109.76	177.7	91.56	133.16
Alluvial Basin	San Timoteo Basin; 8-002.08	0	0	0	0	0
	TOTAL	4,595	3,414	5,318	4,793	7,116
**** Units of measure AF***						
NOTES: Pisgah Peak wells and others just outside Yucaipa Basin are counted in the Yucaipa Basin area.						

11.6.4 Surface Water

The watershed of the Yucaipa Valley extends from the crest of the Crafton Hills in the northwest, to the crest of the Yucaipa Ridge of the San Bernardino Mountains to the north east, and the Yucaipa Hills in the south east to the Badlands of San Timoteo Canyon to the south west. Drainage in the area is by many small ephemeral creeks including Yucaipa Creek, Oak Glen Creek, Wilson Creek, Birch Creek, and San Timoteo Creek. These creeks all begin in the upland areas to the northeast and drain down to the southwest through Live Oak Canyon to San Timoteo Creek which is a tributary of the Santa Ana River.

Stream gauge data and observations by District staff reveal that the creeks are generally dry during most of the year except along their upland reaches where small sustained year-round flows may occur. Irregular flows do occur occasionally along the entire reach of the creeks during both high intensity summer cloudbursts and long duration seasonal winter storms. In both cases, the stream flows generated from these conditions tend to be very flashy, with water levels changing rapidly over time and large amounts of unconsolidated sediments being scoured from the upper reaches and washed downstream. The largest volume of these flow events occurs during the winter storm season from November through April.

The main tributaries in the sphere of influence of the YVWD are considered relatively small by comparison to the Santa Ana River and Mill Creek directly to the north of YVWD. Drainage courses in the boundary of YVWD include Wilson Creek, Oak Glen Creek, Yucaipa Creek, and San Timoteo Wash.

YVWD has operated and maintained a surface water resources from the Oak Glen area since the early 1900's. The existing Oak Glen Surface Water Filtration Facility continues to produce a steady flow of high-quality drinking water for the Yucaipa Valley.

In 2020, local surface water supplies provided 1.5% of the total water demands of YVWD.

11.6.5 Stormwater

YVWD is participating in regional planning efforts to capture additional stormwater for purposes of groundwater recharge with the City of Yucaipa and the City of Calimesa. Water captured in these facilities will be part of the conjunctive use project used to provide a more robust, enhanced and sustainable water supply to existing customers of the YVWD.

11.6.6 Wastewater and Recycled Water

In addition to serving drinking water, Yucaipa Valley Water District also owns and operates the Wochholz Regional Water Recycled Facility (WRWRF). This facility treats wastewater collected from the YVWD service area and from Western Heights Mutual Water Company and South Mesa Mutual Water Company service areas with the exception of a few small pockets where residents depend on their septic systems.

The WRWRF produces a high-quality, tertiary treated recycled water that is used as a non-potable source of water within the YVWD service area. In addition to the recycled water produced at WRWRF, non-potable water which is added to the recycled distribution system is produced at the YVRWFF. This non-potabel water is produced as a by-product of backwashing the drinking water microfilters.

The WRWRF, which has a treatment capacity of 8 million gallons a day, is one of a relatively small number of sewer treatment facilities in the country to be equipped with microfiltration filters and ultraviolet light for disinfection. The treatment process used to transform our sewer water to recycled water is very similar to some drinking water treatment plants. This provides high quality recycled water that is also extremely safe.

The new microfiltration technology is important because it acts as pretreatment to a reverse osmosis system at the water recycling facility to further purify our recycled water. While the microfiltration system does not allow particles larger than 0.1 micrometer to pass through the filtration system and become part of the recycled water supply, the reverse osmosis system creates a physical barrier to stop salt molecules while allowing water molecules to pass through. The resulting water supply is very similar to the purity of rainwater.

This state-of-the-art technology commonly used by desalinization plants to convert ocean water to drinking water will soon be used by YVWD to meet strict water quality objectives set by the

Regional Water Quality Control Board. With the requirement to produce such exceptionally high-quality recycled water, YVWD has developed plans to use the recycled water for the direct benefit of the community.

With the completion of the reverse osmosis facility, YVWD has also extended a brineline to dispose of the salts removed by the treatment system. The Yucaipa Valley Brineline is a 15-mile pipeline that connects to an existing brine disposal pipeline located in San Bernardino. The brine solution created by YVWD, which is about 1/10th as salty as sea water, will be conveyed to the Orange County Sanitation District to be added to their ocean outfall.

YVWD began treating wastewater in 1986. The sewer collection system has been expanded steadily over the years to provide additional recycled water supplies to the community. In the 2005 UWMP, YVWD projected delivering 1,900 AF of recycled water by year 2010; YVWD delivered 2,016 AF of recycled water in 2010.

The Wochholz Regional Water Recycling Facility was recently expanded to a 8.0 MGD wastewater treatment facility. The ultimate facility will be capable of treating up to 11 MGD of wastewater and includes the following major components:

- Septage Receiving Station - A septage receiving facility provides septage haulers an efficient location to discharge septage wastes for treatment at the plant.
- Headworks Grit Removal System - The grit removal system has been recently upgraded and enlarged to increase grit removal efficiency and reduce the impacts of grit on downstream treatment processes.
- Primary Equalization Tank - The primary equalization tank provides YVWD with the ability to stabilize daily flow variations and hold additional wastewater during peak periods for a steady-state treatment flow throughout the treatment facility.
- Secondary Treatment System - The secondary treatment system has been equipped with nitrogen removal technology that is used to provide compliance with the total inorganic nitrogen limits of 6 mg/l.
- Advanced Tertiary Treatment Facilities - Equalized flows are treated with microfiltration technology commonly used in the beverage and drinking water industry. The recycled water product from this treatment process is significantly more pure than the tertiary filters previously used by YVWD. This treatment technology is a precursor to the reverse osmosis treatment process.
- Reverse Osmosis System - YVWD currently operates a 2.5 MGD reverse osmosis treatment system to purify the recycled water produced at the Wochholz Regional Water Recycling Facility. The brine concentrate is delivered to the Inland Empire Brineline for disposal at Orange County Sanitation District pursuant to existing agreements with the San Bernardino Valley Municipal Water District and the Santa Ana Watershed Project Authority.
- Recycled Water Storage Reservoir - A 4.0-MG recycled water storage reservoir and pump station is used to store the recycled water prior to plant effluent.

Table 11-17. DWR Table 6-2: Retail: Wastewater Collected Within Service Area in 2020

<table>
<tr><th colspan="7">Table 6-2 Retail: Wastewater Collected Within Service Area in 2020</th></tr>
<tr><td rowspan="2">☐</td><td colspan="6">There is no wastewater collection system. The supplier will not complete the table below.</td></tr>
<tr><td colspan="6">Percentage of 2015 service area covered by wastewater collection system (optional)</td></tr>
<tr><td></td><td colspan="6">Percentage of 2015 service area population covered by wastewater collection system (optional)</td></tr>
<tr><th colspan="3">Wastewater Collection</th><th colspan="4">Recipient of Collected Wastewater</th></tr>
<tr><th>Name of Wastewater Collection Agency</th><th>Wastewater Volume Metered or Estimated? Drop Down List</th><th>Volume of Wastewater Collected from UWMP Service Area 2020 *</th><th>Name of Wastewater Treatment Agency Receiving Collected Wastewater</th><th>Treatment Plant Name</th><th>Is WWTP Located Within UWMP Area? Drop Down List</th><th>Is WWTP Operation Contracted to a Third Party? (optional) Drop Down List</th></tr>
<tr><td>Yucaipa Valley Water District</td><td>Metered</td><td>4,237</td><td>Yucaipa Valley Water District</td><td>WRWRF</td><td>Yes</td><td>No</td></tr>
<tr><td colspan="2">Total Wastewater Collected from Service Area in 2020:</td><td>4,237</td><td colspan="4"></td></tr>
<tr><td colspan="7">* Units of measure AF</td></tr>
</table>

Table 11-18. DWR Table 6-3: Retail: Wastewater Treatment and Discharge within Service Area in 2020

Submittal Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2020											
☐	**No wastewater is treated or disposed of within the UWMP service area.** The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number *(optional)* 2	Method of Disposal ***Drop down list***	Does This Plant Treat Wastewater Generated Outside the Service Area? ***Drop down list***	Treatment Level ***Drop down list***	2020 volumes [1]				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area [3]	Recycled Outside of Service Area	Instream Flow Permit Requirement
Wochholz Regional Water Recycling Facility	San Timoteo Creek	Creek; Upper tributary to the Santa Ana Watershed	CA 0105619	River or creek outfall	No	Tertiary	4,237	1,677	1,280	0	1,792
						Total	4,237	1,677	1,280	0	1,792

11.6.6.1 Recycled Water System Description

YVWD's existing recycled water system went into operation in 2002. The system currently includes 22 miles of pipeline, approximately 460 service connections, and 5 reservoirs capable of storing 12 million gallons (36.8 AF) of water.

Due to an increasing demand of recycled water, YVWD will continue expanding the recycled water system. YVWD will be constructing a Regional Recycled Water Conveyance System to the southernmost service area boundary. This extension would involve the construction of a 24" recycled water pipeline, approximately 18,500 linear feet (3.5 miles) through the City of Calimesa. The purpose of the pipeline is to provide recycled water service to customers residing within the newly developed dual-plumbed community in the City of Calimesa.

11.6.6.2 Potential, Current, and Projected Recycled Water Uses

YVWD has an extensive recycled water program. The Board of Directors have adopted planning guidelines that require the use of recycled water for front and rear yard irrigation of new development throughout the YVWD service area.

Recycled water is currently used to provide about 16 percent of Yucaipa Valley Water District's overall water demands. A significant portion of YVWD's projected future water demands will be met with the use of recycled water for irrigation of golf courses, parks, landscape areas and front-/rear-yard irrigation of residential dwellings.

To serve the projected water demands, YVWD has implemented an extensive dual water distribution system. The dual water system includes a drinking water conveyance system to convey potable water to customers and a separate recycled water distribution system to convey recycled water to customers.

As water becomes an increasingly precious commodity, Yucaipa Valley Water District is stepping up its recycling efforts so that more water can be reused on golf courses, school grounds, roadside medians and for other landscaping purposes -- even the front and rear yards of new homes.

YVWD has already initiated a significant recycled water program within their service area for landscape irrigation. Future homes in the YVWD service area will be constructed with drinking water for interior use and recycled water for exterior use. These improvements will significantly reduce the GPCD for the community and provide the framework for a robust, sustainable and water conscientious community.

Table 11-19. DWR Table 6-4: Retail: Recycled Water Direct Beneficial Uses within Service Area

Submittal Table 6-4 Retail: Recycled Water Direct Beneficial Uses Within Service Area										
☐	Recycled water is not used and is not planned for use within the service area of the supplier. The supplier will not complete the table below.									
Name of Supplier Producing (Treating) the Recycled Water:		Yucaipa Valley Water District								
Name of Supplier Operating the Recycled Water Distribution System:		Yucaipa Valley Water District								
Supplemental Water Added in 2020 (volume) *Include units*		953.9 AF								
Source of 2020 Supplemental Water		Filtered MF Backwash from the Yucaipa Valley Regional Water Filtration Facility.								
Beneficial Use Type *Insert additional rows if needed.*	**Potential** Beneficial Uses of Recycled Water (Describe)	Amount of **Potential** Uses of Recycled Water (Quantity) *Include volume units* [1]	General Description of 2020 Uses	Level of Treatment *Drop down list*	2020 [1]	2025 [1]	2030[1]	2035[1]	2040[1]	2045[1] (opt)
Agricultural irrigation				Tertiary	22	25	25	25	25	25
Landscape irrigation (exc golf courses)			meridians and parks	Tertiary	1,026	1,250	1,500	2,000	2,300	2,600
Golf course irrigation				Tertiary	300	300	300	300	300	300
Commercial use				Tertiary	14	20	25	30	35	40
Industrial use										
Geothermal and other energy production										
Seawater intrusion barrier										
Recreational impoundment						10	10	10	10	10
Wetlands or wildlife habitat										
Groundwater recharge (IPR)	Beaumont Adjudicated Basin Recharge					2,025	1,940	1,635	1,530	1,425
Reservoir water augmentation (IPR)										
Direct potable reuse										
Other (Description Required)			construction water	Tertiary	12					
				Total:	1,374	3,630	3,800	4,000	4,200	4,400
				2020 Internal Reuse	789					
[1] ***Units of measure - AF***										

Table 11-20. DWR Table 6-5: Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual

Submittal Table 6-5 Retail: 2015 UWMP Recycled Water Use Projection Compared to 2020 Actual		
☐	Recycled water was not used in 2015 nor projected for use in 2020. The supplier will not complete the table below. If recycled water was not used in 2020, and was not predicted to be in 2015, then check the box and do not complete the table.	
Beneficial Use Type	2015 Projection for 2020 [1]	2020 Actual Use[1]
Agricultural irrigation		22
Landscape irrigation (exc golf courses)	1,651	1,026
Golf course irrigation		300
Commercial use		14
Industrial use		
Geothermal and other energy production		
Seawater intrusion barrier		
Recreational impoundment		
Wetlands or wildlife habitat		
Groundwater recharge (IPR)	2,828	
Reservoir water augmentation (IPR)		
Direct potable reuse		
Other (Description Required)	Construction water	12
Total	4,479	1,374
[1] Units of measure - AF		
NOTE: IPR is an ongoing effort.		

11.6.6.3 Actions to Encourage and Optimize Future Recycled Water Use

In August 2008, YVWD adopted a strategic plan for a sustainable future and enhance water management. One of the most significant elements of the strategic plan is the requirement for new homes to be constructed with dual-plumbed infrastructure. This requirement coupled with new landscape design requirements will significantly improve the beneficial use of water throughout the community.

Table 11-21. DWR Table 6-6: Retail: Methods to Expand Future Recycled Water Use

Table 6-6 Retail: Methods to Expand Future Recycled Water Use			
☐ `	Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation.		
	Provide page location of narrative in UWMP		
Name of Action	Description	Planned Implementation Year	Expected Increase in Recycled Water Use *
Dual-plumbing of new homes	YVWD resolution requiring front and backyard irrigation with recycled water adopted in 2008	2020	2,000
Recycled ASR	Injection/recharge	2022	2,500
Total			4,500
Units of Measurement - Acre Feet			

11.6.7 Desalinated Water Opportunities

The need for brackish groundwater desalting is somewhat limited in the Yucaipa Valley. While elevated salts are a concern in the groundwater basins, YVWD has already implemented programs to reduce the salinity in the Yucaipa Management Zone, Beaumont Management Zone and San Timoteo Management Zone pursuant to Basin Plan requirements adopted by the Santa Ana Regional Water Quality Control Board in 2004.

The development of (or financial participation in) a new seawater desalination project, while costly, is being investigated by other wholesale and retail water agencies in southern California. Because the Yucaipa Valley is an inland area, for desalination to work it would be necessary for agencies in the San Bernardino Valley to join with other water purveyors in the development of a coastal desalination facility and then receive water from the SWP supplies of other participants via an exchange. It is not cost-effective for the San Bernardino Valley to receive direct delivery of desalted ocean water.

Seawater desalination is an alternative that is technically viable. However, production and treatment costs have historically been several times higher than those of SWP costs and conventional treatment.

11.6.8 Water Exchanges and Transfers

YVWD's acutely aware of possible water shortage conditions in the area and is mitigating potential shortages in its service area and the service area of neighboring purveyors by participating in a number of exchange plans, transfers, and emergency interties.

YVWD, along with several other local water agencies, participates in the Santa Ana River – Mill Creek Cooperative Water Project Agreement. This agreement went into place in 1976 and outlines the procedures for exchanges and transfers among the agencies. Although YVWD has not used this agreement for exchanges in recent years, it can easily be utilized when necessary.

11.6.8.1 Transfers

YVWD has sold treated water to Western Heights Water Company annually since 2008. The average water sold to Western Heights is 442 AF per year between 2016 and 2020.

6.2.7.3 Emergency Interties

YVWD is in the process of reviewing potential interties with the City of Redlands and the Beaumont Cherry Valley Water District to meet needs during periods of lowered groundwater levels. These connections would be short-term, as needed purchases and are not accounted for as additional water supply.

11.6.9 Future Water Projects

YVWD is currently enhancing its ability to utilize its existing water supply sources through several projects that are in various phases of implementation, from planning to preliminary design to construction. Specifically, YVWD is in the process of reviewing concept documents related to participation in the Bunker Hill Conjunctive Use Project. This program would provide a water banking opportunity in the adjacent Bunker Hill Groundwater Basin during wet periods for extraction when imported supplies from the State Water Project are limited.

Additionally, YVWD is completing the necessary studies to implement the Calimesa Aquifer Storage and Recovery Project. This project will be a system of injection wells that will inject recycled water into the aquifer. That water can be pulled from those same injections wells to be used as recycled water or drawn from wells farther away as potable water. This project would allow YVWD a great amount of flexibility to meet both the recycled and potable needs of the community.

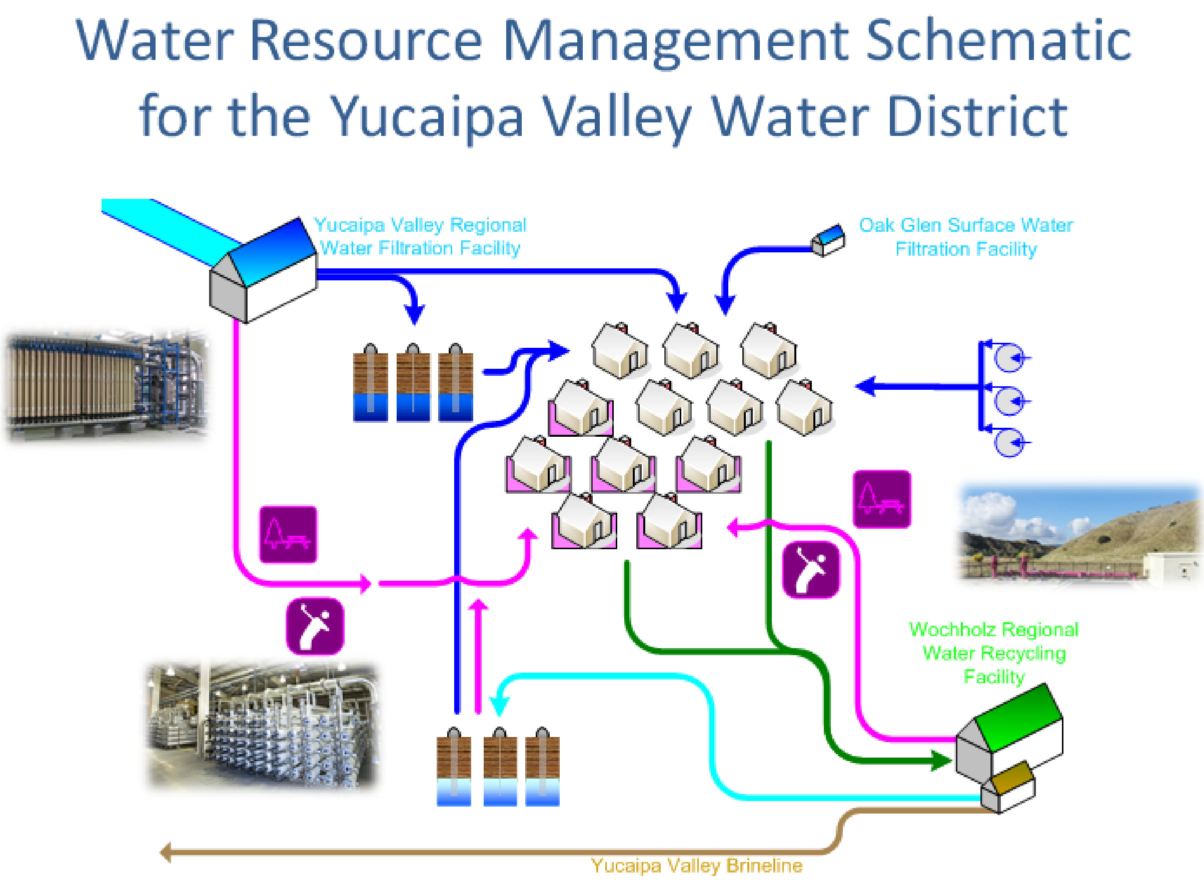
Table 11-22. DWR Table 6-7: Retail: Expected Future Water Supply Projects or Programs

Submittal Table 6-7 Retail: Expected Future Water Supply Projects or Programs						
☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☑	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other suppliers?		Description (if needed)	Planned Implementation Year	Planned for Use in Year Type *Drop Down List*	Expected Increase in Water Supply to Supplier* *This may be a range*
	Drop Down List (y/n)	*If Yes, Supplier Name*				
Add additional rows as needed						
Calimesa ASR	No			2022	All Year Types	2,500-3,500
Bunker Hill CUP	Yes	SBVMWD		2023	All Year Types	10,000-20,000
Units of measure AF						

11.6.10 Summary of Existing and Planned Sources of Water

As addressed in previous sections YVWD has numerous potable sources including imported water, groundwater from three separate basins, and surface water from a local creek. YVWD also produces a high-quality recycled water that is used throughout the district from the WRWRF. Lastly, the microfiltration backwash from the YVWRFF is added to the recycled system.

Future homes will be dependent on recycled water for irrigation. The Calimesa ASR project will aid in that endeavor by ensuring there is a recycled supply when needed or being to draw the water further from the injection wells as potable water. The Bunker Hill Conjunctive Use Project will allow YVWD to store water in wet years and use it during dry years.



11.6.10.1 Description of Supplies

YVWD has a diverse portfolio of water resources that can easily be adjusted as the available supplies of each change. Because the local supply of surface water and groundwater is limited in this semiarid region, water purveyors in the Yucaipa Valley have explored several alternatives related to the development of water resources in the area. The groundwater extractions by appropriators in the sphere of influence of the Yucaipa Valley Water District have decreased over the past five years. This is mainly attributed to the increased use of recycled water and imported water in the region.

During a shortage, it is anticipated that direct deliveries are the first priority for any SWP water coupled with immediate reductions in drinking water use. With the aggressive use of recycled water for new homes, the critical nature of the direct deliveries will become more evident in the future since YVWD will only be using imported water for drinking water at new homes and not for irrigation of front and rear yards. To further bolster the imported water supplies, YVWD will continue to recharge groundwater basins in wet years and can use groundwater sources to back up imported water deliveries during a single-dry and multiple-dry years.

11.6.10.2 Quantification of Supplies

Table 11-23 summarizes the water resources used by YVWD in 2015, and the projected future supplies are summarized in Table 11-24. The estimated amount of imported water supply shown in Table 11-24 has been estimated by YVWD and provided to Valley District.

Table 11-23. DWR Table 6-8: Retail: Water Supplies — Actual

Table 6-8 Retail: Water Supplies — Actual				
Water Supply		2020		
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool	Additional Detail on Water Supply	Actual Volume*	Water Quality Drop Down List	Total Right or Safe Yield* (optional)
Purchased or Imported Water	Yucaipa Valley Regional Water Filtration Facility	4,057	Drinking Water	
Groundwater (not desalinated)	Groundwater Supplies	7,116	Drinking Water	
Surface water (not desalinated)	Oak Glen Filtration Facility	171	Drinking Water	
Recycled Water	Regional Water Recycling Facility	1,281	Recycled Water	
Other	Backwash at YVRWFF	954	Other Non-Potable Water	
Total		13,579		0
*Units of measure - AF				

Table 11-24. DWR Table 6-9: Retail: Water Supplies — Projected

Water Supply	Additional Detail on Water Supply	Projected Water Supply * Report To the Extent Practicable									
		2025		2030		2035		2040		2045 (opt)	
Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
Groundwater (not desalinated)	Beaumont Adjudicated Basin	15,000		15,000		15,000		15,000		15,000	
Groundwater (not desalinated)	San Timoteo Basin; 8-002.08	250		250		250		250		250	
Groundwater (not desalinated)	Yupper Santa Ana Valley; 8-002.06; Bunker Hill, San Bernardino Basin	750		750		750		750		750	
Groundwater (not desalinated)	Yucaipa Basin; 8-002.07	29,000		34,000		39,000		44,000		49,000	
Surface water (not desalinated)	Oak Creek/Birch Creek/Well 25 (Groundwater under the influence of surface water)	250		250		250		250		250	
Purchased or Imported Water	SGPWA	450		450		500		500		600	
Purchased or Imported Water	SBVMWD to YVRWFF	6,750		7,500		9,000		9,750		10,500	
Purchased or Imported Water	SBVMWD to Yucaipa Basin groundwater recharge	2,250		2,500		3,000		3,250		3,500	
Recycled Water	WRWRF	4,480		4,700		4,950		5,200		5,450	
Other											
	Total	59,180	0	65,400	0	72,700	0	78,950	0	85,300	0

***Units of measure (AF, CCF, MG)** *must remain consistent throughout the UWMP as reported in Table 2-3.*

Groundwater supplies for YvWD reflect volume available since YVWD has recharged additional state water project supplies totaling approximately 28,783 AF.

11.6.11 Special Conditions

A number of special conditions may affect YVWD's water supply availability. YVWD projects 59,000 AF in 2025 and 85,000 AF by 2045. This represents the active groundwater recharge and aquifer storage recovery projects YVWD has in place. YVWD also recognizes these projections are significantly different from the regional water budget illustrated in the overall IRUWMP. YVWD's service area is unique in relation to the water districts within the San Bernardino Valley. Active recharge through local water sources is minimal. Purchasing and storing imported water during wet years allows YVWD to have an additional supply of available sources as illustrated in Table 11-24.

11.6.11.1 Climate Change Effects

Climate change has the potential to change water supply availability in the future. The amount of imported water available to YVWD from the State Water Project is dependent upon the precipitation received that year. Climate change may also affect the local precipitation patterns which can impact the precipitation recharge and surface water percolation in the local groundwater basins. However, YVWD does not anticipate an issue with accessing water resources due to climate change or severe droughts. YVWD recharges excess water into the groundwater basins during wet years. The amount of water currently stored would provide enough water for YVWD's service area in case of a multi-year drought. YVWD intends to increase the water in storage and expects to have 85,000 AF of usable groundwater by 2045.

11.6.12 Energy Use

Energy reporting has many benefits for water suppliers and their customers including:

- Identifying energy saving opportunities as energy consumption is often a large portion of the cost of delivering water.
- Calculating energy savings and greenhouse gas (GHGs) emissions reductions associated with water conservation programs.
- Potential opportunities for receiving energy efficiency funding for water conservation programs.
- Informing climate change mitigation strategies.
- Benchmarking of energy use or generation at each water acquisition and delivery step and the ability to compare energy use and generation among similar agencies.

The tables below show the energy intensity of the water, wastewater, and recycled water processes.

Table 11-25. DWR Table O-1A: Recommended Energy Use Reporting – Water Supply Process Approach

Table O-1A: Recommended Energy Reporting - Water Supply Process Approach									
Enter Start Date for Reporting Period: 1/1/2020		Urban Water Supplier Operational Control							
End Date: 12/30/2020									
☐ Is upstream embedded in the values reported?		Water Management Process						Non-Consequential Hydropower (if applicable)	
	Water Volume Units Used	Extract and Divert	Place into Storage	Conveyance	Treatment	Distribution	Total Utility	Hydropower	Net Utility
Volume of Water Entering Process	AF	*7,116.10*	*0.00*	*0.00*	*5,830.90*	*11,344.79*	*11,344.79*	*0*	*11,344.79*
Energy Consumed (kWh)	*N/A*	*7,102,321.00*	*0.00*	*0.00*	*2,237,833.00*	*3,731,982.00*	*13,072,136.00*		*13,072,136.00*
Energy Intensity (kWh/vol.)	*N/A*	*998.06*	*0.00*	*0.00*	*383.80*	*329.00*	*1,152.30*	*0.0*	*1,152.30*

Table 11-26. DWR Table O-2: Recommended Energy reporting – Wastewater & Recycled Water

	Collection / Conveyance	Treatment	Discharge / Distribution	Total
Volume of Wastewater Entering Process (volume units selected above)	4,237	4,237		4,237
Wastewater Energy Consumed (kWh)	654,340	7,964,082		8,618,934
Wastewater Energy Intensity (kWh/volume)	154.4	1,879.7		2,034.2
Volume of Recycled Water Entering Process (volume units selected above)	0	0	1,280.58	1,280.58
Recycled Water Energy Consumed (kWh)	0	0	352,377	352,377
Recycled Water Energy Intensity (kWh/volume)	0.0	0.0	275.2	275.2

11.7 Water Service Reliability and Drought Risk Assessment

11.7.1 Water Service Reliability Assessment

Water supplies may be interrupted or reduced significantly in a number of ways, such as drought which limits supplies, an earthquake which damages delivery or storage facilities, or a regional power outage. YVWD has a Water Shortage Contingency Plan for regional water supply sources (imported water and groundwater).

While water supply disruptions can occur for a variety of reasons, a weather related water shortage, or drought, is one category of particular importance to the Yucaipa Valley Water District for reasons described below. Droughts are naturally occurring but unpredictable weather events of varying frequency, duration and severity. In the Yucaipa Valley, historical data indicates a high probability of short term and/or multi-year drought conditions.

11.7.1.1 Imported Water

During times of State-wide drought conditions, the availability of SWP may be reduced. These conditions are normally known in advance, providing YVWD with the opportunity to plan for the reduced supply. During an extended drought period, it is a priority to make direct deliveries to the water treatment plants operated by Redlands, West Valley Water District, and YVWD and to maintain lake levels at Big Bear Lake (Big Bear Lake water also feeds the water treatment plants of Redlands and YVWD).

In the case of a shortage, YVWD would utilize additional groundwater through groundwater well production from the Bunker Hill Conjunctive Use Project and groundwater stored in the Yucaipa Groundwater Basin.

11.7.1.2 Groundwater Water Quality

YVWD groundwater wells have not been impacted by water quality issues. YVWD continues to monitor for any indication of groundwater contamination. See Consumer Confidence Report, Part 4 Appendix K-11.

11.7.1.3 Single Versus Dry Year Reliability

Based on the studies and information listed in Chapter 6, it is anticipated that groundwater pumping by YVWD will not need to be reduced or curtailed during a single-dry or multi-dry year. Although, YVWD encourages additional water use efficiency measures during drought. These actions would result in reduced pumping of the groundwater basins. In addition, the planned water management actions and strategies below will also ensure water reliability during multi-dry years.

11.7.1.4 Planned Water Management Actions and Strategies

The Calimesa Aquifer Storage and Recovery Program has been in development to utilize the groundwater basin for the additional storage and extraction of recycled water and drinking water. This project will involve the construction of a lake and groundwater injection facilities in the Beaumont Basin to maximize the operational efficiency of groundwater resources within the Calimesa portion of the

District's service area. The goal for the next five years will be to complete the preliminary design, environmental review, tracer study and construction for the project.

The expansion of the recycled water system adds an additional planned water management strategy to increase water reliability. YVWD expects to increase recycled water use to 4,000 AF/Year.

11.7.1.5 Service Reliability – Year Type Characterization

Table 11-27. DWR Table 7-1: Retail: Basis of Water Year Data (Reliability Assessment)

Table 7-1 Retail: Basis of Water Year Data (Reliability Assessment)			
Year Type	**Base Year** If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 2019-2020, use 2020	Available Supplies if Year Type Repeats	
		☑ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location ____________	
		☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both.	
		Volume Available *	% of Average Supply
Average Year	2020	57,013	100%
Single-Dry Year	2013	53,500	94%
Consecutive Dry Years 1st Year	2013	50,000	88%
Consecutive Dry Years 2nd Year	2013	46,500	82%
Consecutive Dry Years 3rd Year	2013	43,000	75%
Consecutive Dry Years 4th Year	2013	39,500	69%
Consecutive Dry Years 5th Year	2013	36,000	63%
Supplier may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If a Supplier uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table.			
*Units of measure - AF			

11.7.1.6 Description of Management Tools and Options

Management tools and options being implemented or planned for implementation are included in Table 11-28.

Table 11-28. DWR Table 7-2: Retail: Normal Year Supply and Demand Comparison

Table 7-2 Retail: Normal Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 *(Opt)*
Supply totals (from Table 6-9)	59,180	65,400	72,700	78,950	85,300
Demand totals (from Table 4-3)	16,288	15,826	15,430	15,072	14,746
Difference	42,892	49,574	57,270	63,879	70,554

11.7.2 Drought Risk Assessment

The methodology used to determine the water supply shortage conditions during extended drought are comprised of:

Imported Water – YVWD purchases water from San Bernardino Valley Municipal Water District and San Gorgonio Pass Water Agency. Imported water supplies have ranged from 40% - 50% of the total water portfolio for the past 10 years. YVWD plans to increase the use of recycled water in order to decrease reliance on imported water.

Groundwater – Groundwater is managed and available to YVWD from the Yucaipa Basin, San Timoteo Basin, Beaumont Basin and San Bernardino Basin.

Surface Water – A prolonged drought would reduce surface water supplies. YVWD does not rely heavily on surface water supplies since this portion of supply makes up only 1% - 2% of the entire water portfolio.

Recycled Water – Recycled water represents 10% of the total water supply. A strategic goal of YVWD is to increase the use of recycled water to approximately 33% in order to reduce reliance on imported and local supplies.

Table 11-28. DWR Table 7-3: Retail: Single Dry Year Supply and Demand Comparison

Table 7-3 Retail: Single Dry Year Supply and Demand Comparison					
	2025	2030	2035	2040	2045 (Opt)
Supply totals*	59,180	65,400	72,700	78,900	85,300
Demand totals*	12,658	12026	11,430	10,872	10,346
Difference	46,522	53,374	61,270	68,028	74,954

Table 11-29. DWR Table 7-4: Retail: Multiple Dry Years Supply and Demand Comparison

Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison						
		2025*	2030*	2035*	2040*	2045* (Opt)
First year	Supply totals	59,180	65,400	72,700	78,950	85,300
	Demand totals	12,658	12,026	11,430	10,872	10,346
	Difference	46,522	53,374	61,270	68,078	74,954
Second year	Supply totals	55,261	61,000	67,000	68,000	69,000
	Demand totals	11,696	11,256	10,744	10,470	9,994
	Difference	43,565	49,744	56,256	57,530	59,006
Third year	Supply totals	55,888	58,000	64,000	65,000	66,000
	Demand totals	10,807	10,536	10,100	10,082	9,654
	Difference	45,081	47,464	53,900	54,918	56,346
Fourth year	Supply totals	56,861	55,000	61,000	62,000	63,000
	Demand totals	9,986	9,862	9,494	9,709	9,326
	Difference	46,875	45,138	51,506	52,291	53,674
Fifth year	Supply totals	55,104	52,000	58,000	59,000	60,000
	Demand totals	9,227	9,230	8,924	9,350	9,009
	Difference	45,877	42,770	49,076	49,650	50,991
Units of Measurement - AF						

Table 11-30. DWR Table 7-5: Retail: Five-Year Drought Risk Assessment Tables to Address Water Code Section 10635 (b)

Submittal Table 7-5: Five-Year Drought Risk Assessment Tables to address Water Code Section 10635(b)	
2021	**Total**
Total Water Use	11,673
Total Supplies	57,555
Surplus/Shortfall w/o WSCP Action	45,882
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	45,882
Resulting % Use Reduction from WSCP action	0%
2022	**Total**
Total Water Use	12,000
Total Supplies	58,100
Surplus/Shortfall w/o WSCP Action	46,100
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	46,100
Resulting % Use Reduction from WSCP action	0%
2023	**Total**
Total Water Use	12,330
Total Supplies	58,625
Surplus/Shortfall w/o WSCP Action	46,295
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	46,295
Resulting % Use Reduction from WSCP action	0%
2024	**Total**
Total Water Use	12,450
Total Supplies	58,970
Surplus/Shortfall w/o WSCP Action	46,520
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	46,520
Resulting % Use Reduction from WSCP action	0%
2025	**Total**
Total Water Use	12,550
Total Supplies	59,180
Surplus/Shortfall w/o WSCP Action	46,630
Planned WSCP Actions (use reduction and supply augmentation)	
WSCP - supply augmentation benefit	
WSCP - use reduction savings benefit	
Revised Surplus/(shortfall)	46,630
Resulting % Use Reduction from WSCP action	0%

11.8 Water Shortage Contingency Plan

YVWD adopted a revised Water Shortage Contingency Plan (WSCP) and Water Waste Ordinance in 2019. The WSCP is in Part 4 Appendix K-9.

Table 11-31. DWR Table 8-1: Water Shortage Contingency Plan Levels

Table 8-1 Water Shortage Contingency Plan Levels		
Shortage Level	Percent Shortage Range	Shortage Response Actions (*Narrative description)*
1	Up to 10%	Normal Conditions: no conservation triggers or water savings objectives are initiated at this level.
2	Up to 20%	Public is notified of shortage. Customers are reminded to conserve water. Asses main flushing and reservoir cleaning activities.
3	Up to 30%	Continued voluntary cooperation. Consult with customer groups, initiate major public media campaign, identify next steps, regulate construction meter activity, contact largest customers, and prepare for level 4.
4	Up to 40%	Prohibit watering during the day, limit watering to certain days, prohibit ornamental fountains, prohibit car washing etc.
5	Up to 50%	Implement rate surcharge, continue water patrols, curtail fire flow and pipeline testing, turf irrigation prohibited, rescind construction meters
6	>50%	Monthly community meetings and enforce fines and penalties.

Table 11-32. DWR Table 8-2: Demand Reduction Actions

Table 8-2: Demand Reduction Actions				
Shortage Level	Demand Reduction Actions **Drop down list** These are the only categories that will be accepted by the WUEdata online submittal tool. Select those that apply.	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)*	Additional Explanation or Reference *(optional)*	Penalty, Charge, or Other Enforcement? ***For Retail Suppliers Only*** *Drop Down List*
1	Expand Public Information Campaign	10%		No
2	Provide Rebates on Plumbing Fixtures and Devices	20%		No
3	Decrease Line Flushing	30%		No
3	Expand Public Information Campaign			No
3	Landscape - Restrict or prohibit runoff from landscape irrigation			No
4	Increase Water Waste Patrols	40%		Yes
5	Improve Customer Billing	50%		Yes
6	Moratorium or Net Zero Demand Increase on New Connections	60%		Yes

Penalties, Charges, Other Enforcement of Prohibitions

In the implementation of the water shortage contingency plan, the California Water Code Section 31029 makes any violation of the YVWD's Water Shortage Contingency Plan a criminal misdemeanor and upon conviction thereof, the violator will be subject to punishment by fine, imprisonment, or both as may be allowed by law. In addition to criminal penalties, violators of the mandatory provisions of the ordinance will be subject to civil action initiated by YVWD.

No single strategy can be created which will meet the needs of the District for all emergency scenarios. The criteria established for the Water Shortage Contingency Plan provides the full latitude for the Board of Directors to implementation penalties, charges and other enforcement prohibitions based on the specific situation.

Emergencies initially require quick and immediate response. Once an assessment is made as to how long it will take to restore the system, the immediate response strategy may change if it appears that the repair process will be lengthy. The strategy for most emergencies can be narrowed to measures having the most immediate impact on water supply and consumption. All needed and available back up supplies would be activated during an emergency, including the use of interties and standby water production wells.

Consumption Reduction Methods

YVWD offers various rebates to encourage conservation. The reduction goal is to balance supply and demand.

Determining Water Shortage Reductions

Under normal conditions, YVWD prepares monthly production reports which are reviewed and compared to production reports and pumping statistics from prior months and the same period of the prior year. The data gathered summarized in these production reports are automatically generated on a daily basis to assist with the determination of water shortage reductions.

Revenue and Expenditure Impacts

It is difficult to precisely gauge the revenue and expenditure impacts of water shortages. The drought contingency plan provides for both prohibitions, water use allotments, and penalty pricing for exceeding allotments, the ultimate revenue impacts will be based upon a mix of responses to these requirements. Additionally, weather can be a factor as well. Customers may find it more difficult to meet allocations during hot weather where a desire to maintain landscaping uses at a higher level exists, and therefore more customers may find themselves paying penalty rates.

For planning purposes, it is assumed that District conservation goals are met at each stage and that revenue losses are proportional to the commodity rate revenue not received, exclusive of penalty rates, plus revenue losses due to particular prohibitions. It is also assumed that additional District expenses for implementing the plan would be offset by excess use penalties.

Based upon YVWD's current fiscal situation, impacts during Stages I and II could be absorbed by District reserves without requiring a rate increase, provided the shortage condition did not persist for more than two years. Impacts beyond two years would need to be reassessed.

Stages III and beyond could require reductions in the pay-as-you-go portion of YVWD's Capital Improvement Program. Additionally, deferring non-critical maintenance items and filling some personnel vacancies would be considered. Should revenue loss impacts begin to affect essential District operations, a temporary emergency surcharge on the base water rate could be imposed to fund District operations.

YVWD makes contributions to a rate stabilization fund contribution in accordance with a District Designated Fund Policy. Funds discussed in the policy include the Rate Stabilization Fund and the Capital Replacement Fund.

In the event of a water shortage, a two-point program will be utilized to meet the fiscal shortfall of reduced water revenues:

1. Reduce operation and maintenance expenses
2. Defer selected capital improvement projects until water shortage situation improves.

3. Rate Stabilization Funds, once accumulated, will serve as a third means of meeting fiscal shortfalls.

Catastrophic Supply Interruption

YVWD has identified system vulnerabilities due to fire, earthquake, and power outages. YVWD has developed an Emergency Response Plan. YVWD has in place back-up power supplies at critical locations within the distribution system. Due to South Coast Air Quality Management Board rules and economic restraints, a back-up power supply source at every plant within YVWD's system is not feasible. YVWD maintains portable pumps that can be used to transfer water internally but cannot be used for production.

Currently, YVWD's water storage capacity would provide a potable supply for customers' non-irrigation uses (assumes implementation of Water Shortage Contingency Plan) for an estimated two to three days. As described above, YVWD participates in multiple mutual aid agreements and has agreements in place for the provision of water supply and/or manpower. In the event of a natural or man-made disaster that could affect the YVWD's ability to provide a potable water supply for up to thirty days, the following measures will be implemented as required:

1. The Boil Water notification program will be activated. The notice will be provided to local radio stations and newspapers. YVWD will contact the media and City and County agencies. Customers will be notified of supplemental sources of water for cooking and drinking (e.g. swimming pools, water heaters, and bottled water).
2. YVWD is a participant in Emergency Response Network of the Inland Empire (ERNIE), a water/wastewater mutual aid network within San Bernardino and Riverside counties. During a Catastrophic Supply Interruption, the Mutual Aid Agreement with ERNIE will be implemented. The General Manager will contact general managers from surrounding agencies to obtain assistance in providing manpower for repairs and/or a supplemental supply of water.
3. A public information program will be initiated. The General Manager will appear on local television and provide daily reports to the local newspaper and radio stations. Members of the Board of Directors will speak to local service clubs and chambers of commerce.

Table 11-33. DWR Table 8-3: Supply Augmentation and Other Actions

Submittal Table 8-3: Supply Augmentation and Other Actions			
Shortage Level	Supply Augmentation Methods and Other Actions by Water Supplier	How much is this going to reduce the shortage gap? *Include units used (volume type or percentage)**	Additional Explanation or Reference *(optional)*
1	Other Purchases	11,500	Three party agreement
2	New Recycled Water	2,500	Aquifer storage and recovery
3	Stored Emergency Supply	28,783	Yucaipa Basin
*Units of Measurement - AF			

11.9 Demand Management Measures

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

DMM 1 – Water Waste Prevention Ordinance

YVWD adopted a new water waste ordinance in 2019, Ordinance 60-2019. The ordinance addresses new state legislation requirements for water retailers to achieve their conservation goals.

DMM 2 – Metering

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

DMM 3 - Retail Conservation Pricing

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

The District is currently implementing conservation pricing. With the incentive to conserve structured in the water rate, it is deemed unnecessary to attempt to construct a commodity rate structure for sewer service. Additionally, the accuracy of such rate structures, which rely on a formula based on water consumption, are questionable as they generally assess charges based upon winter season demands, which vary demanding on hydrology of a given year and landscaping demands YVWD UWMP, 2005).

DMM 4 – Public Education and Outreach

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

DMM 5 – Distribution System Real Loss Programs

YVWD recognizes that completing the standard water audit and balance using the American Water Works Association (AWWA) Water Loss software and completing the Component Analysis. This is to determine the current volume of apparent and real water loss and the cost impact of these losses on utility operations. The AWWA Water Audit has been completed but the Component Analysis was not complete.

DMM 6 – Water Conservation Program Coordination

YVWD is a member of the Basin Technical Advisory Commission, Water Conservation Subcommittee. The committee meets bi-monthly to coordinate water conservation programs and events throughout the SBVMWD's service area.

11.10 Plan Adoption, Submittal, and Implementation

Table 11-34. DWR Table 10-1: Retail: Notification to Cities and Counties

Submittal Table 10-1 Retail: Notification to Cities and Counties		
City Name	60 Day Notice	Notice of Public Hearing
Banning	Yes	Yes
Beaumont	Yes	Yes
Calimesa	Yes	Yes
Colton	Yes	Yes
Fontana	Yes	Yes
Grand Terrace	Yes	Yes
Highland	Yes	Yes
Loma Linda	Yes	Yes
Redlands	Yes	Yes
Rialto	Yes	Yes
Riverside	Yes	Yes
San Bernardino	Yes	Yes
Yucaipa	Yes	Yes
County Name	60 Day Notice	Notice of Public Hearing
Riverside County	Yes	Yes
San Bernardino County	Yes	Yes