
2020

PART 2: LOCAL AGENCY UWMPs

UPPER SANTA ANA RIVER WATERSHED

INTEGRATED REGIONAL URBAN WATER MANAGEMENT PLAN



CITY OF LOMA LINDA

2020 IRUWMP

Part 2 Chapter 3

Loma Linda UWMP

JUNE 30, 2021

Prepared by Water Systems Consulting, Inc.



TABLE OF CONTENTS

3. City of Loma Linda	3-1
3.1 System Description.....	3-1
3.1.1 Population	3-3
3.1.2 Land Use.....	3-4
3.2 Water Use	3-4
3.2.1 Water Use by Sector.....	3-4
3.2.2 Projected Water Use	3-7
3.2.3 Water Use for Lower Income Households.....	3-9
3.2.4 Climate Change Considerations.....	3-9
3.3 SBX7-7 Baseline and Targets.....	3-9
3.3.1 Baseline and Target.....	3-9
3.3.2 2020 Compliance Daily Per-Capita Water Use (GPCD).....	3-10
3.4 Water Supply	3-10
3.4.1 Purchased or Imported Water	3-10
3.4.2 Groundwater	3-10
3.4.3 Surface Water	3-10
3.4.4 Stormwater.....	3-11
3.4.5 Wastewater and Recycled Water.....	3-11
3.4.6 Water Exchanges and Transfers	3-13
3.4.7 Summary of Existing and Planned Sources of Water.....	3-13
3.4.8 Energy Intensity	3-17
3.5 Water Service Reliability Assessment.....	3-18
3.5.1 Constraints on Water Sources	3-18
3.5.2 Year Type Characterization.....	3-18
3.5.3 Water Service Reliability.....	3-18
3.6 Drought Risk Assessment	3-20
3.7 Water Shortage Contingency Plan	3-22
3.8 Demand Management Measures.....	3-22
3.8.1 Existing Demand Management Measures	3-22
3.9 Adoption, Submittal and Implementation.....	3-24
3.9.1 Notice of Public Hearing	3-24
3.9.2 Public Hearing and Adoption	3-24
3.9.3 Plan Submittal.....	3-24

3.9.4 Public Availability	3-24
3.9.5 Amending an Adopted UWMP or Water Shortage Contingency Plan	3-24

LIST OF FIGURES

Figure 3-1: City of Loma Linda Water Service Area Map	3-2
Figure 3-2: City of Loma Linda 2016-2020 Water Consumption by Customer Class	3-5
Figure 3-3: City of Loma Linda Projected Future Water Consumption by Customer Class.....	3-8
Figure 3-4: City of Loma Linda Projected Supply and Demand Comparison (Acre-Feet).....	3-17

LIST OF TABLES

Table 3-1: DWR 3-1R Current and Projected Population.....	3-3
Table 3-2: City of Loma Linda 2016-2020 Connections by Customer Class	3-4
Table 3-3: 2016-2020 Actual Water Use (AFY).....	3-5
Table 3-4: DWR 4-4R 12 Month Water Loss Audit Reporting (AF)	3-6
Table 3-5: DWR 4-2R Projected Demands for Water (AF).....	3-7
Table 3-6: DWR 4-3R Total Gross Water Use (AF).....	3-8
Table 3-7: SBX 7-7 2020 Compliance	3-10
Table 3-8: DWR 6-2R Wastewater Collected within Service Area in 2020 (AF).....	3-12
Table 3-9: DWR 6-8R Actual Water Supplies in 2020 (AF).....	3-15
Table 3-10: DWR 6-9R Projected Water Supplies (AF)	3-16
Table 3-11: DWR 7-2R Normal Year Supply and Demand Comparison (AF).....	3-16
Table 3-12: DWR 7-1R Basis of Water Year Data.....	3-19
Table 3-13: DWR 7-3R Single Dry Year Supply and Demand Comparison (AF).....	3-19
Table 3-14: DWR 7-4R Multiple Dry Years Supply and Demand Comparison.....	3-20
Table 3-15: DWR 7-5 Five-Year Drought Risk Assessment (AF)	3-21

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

- 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

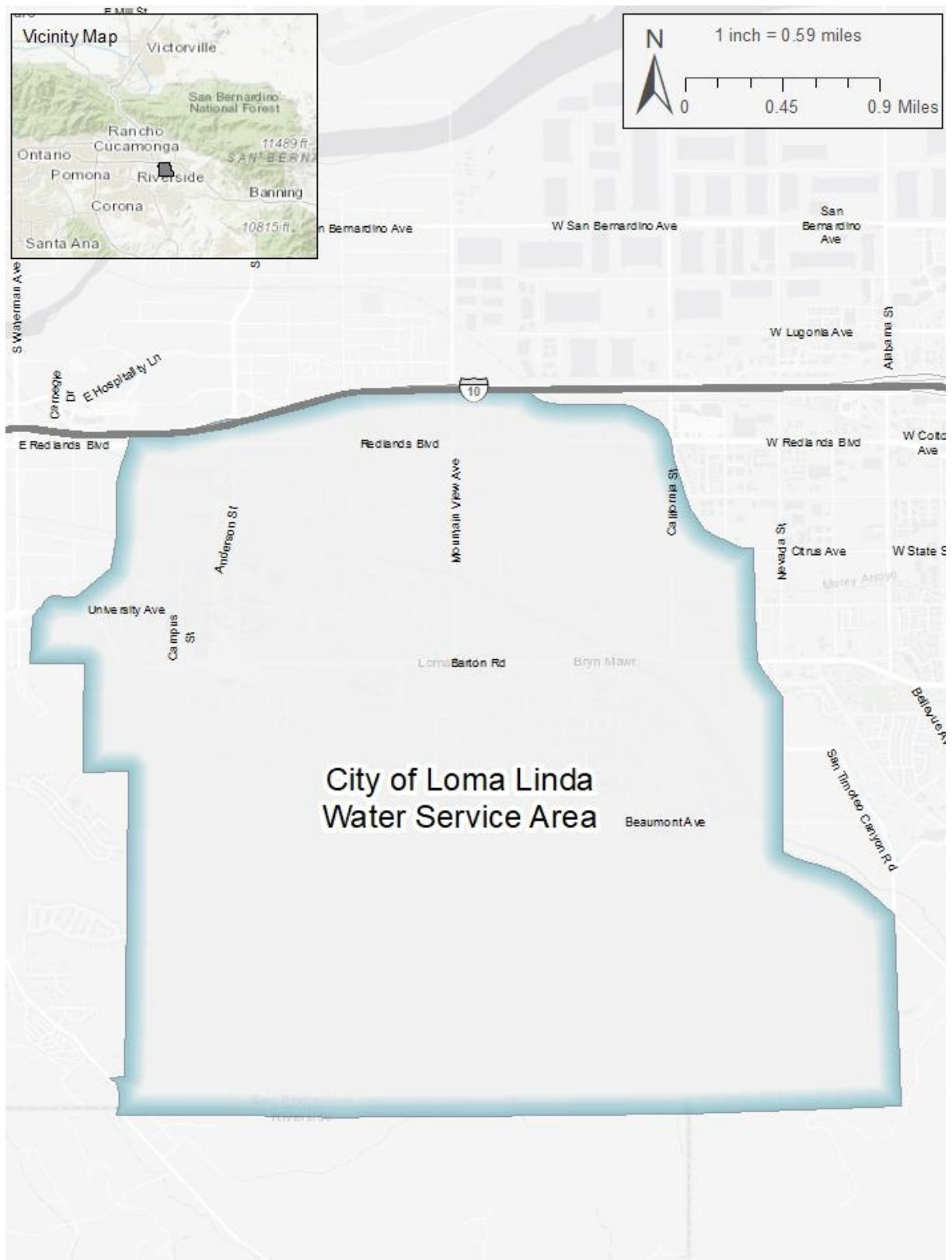


Figure 3-1: City of Loma Linda Water Service Area Map

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

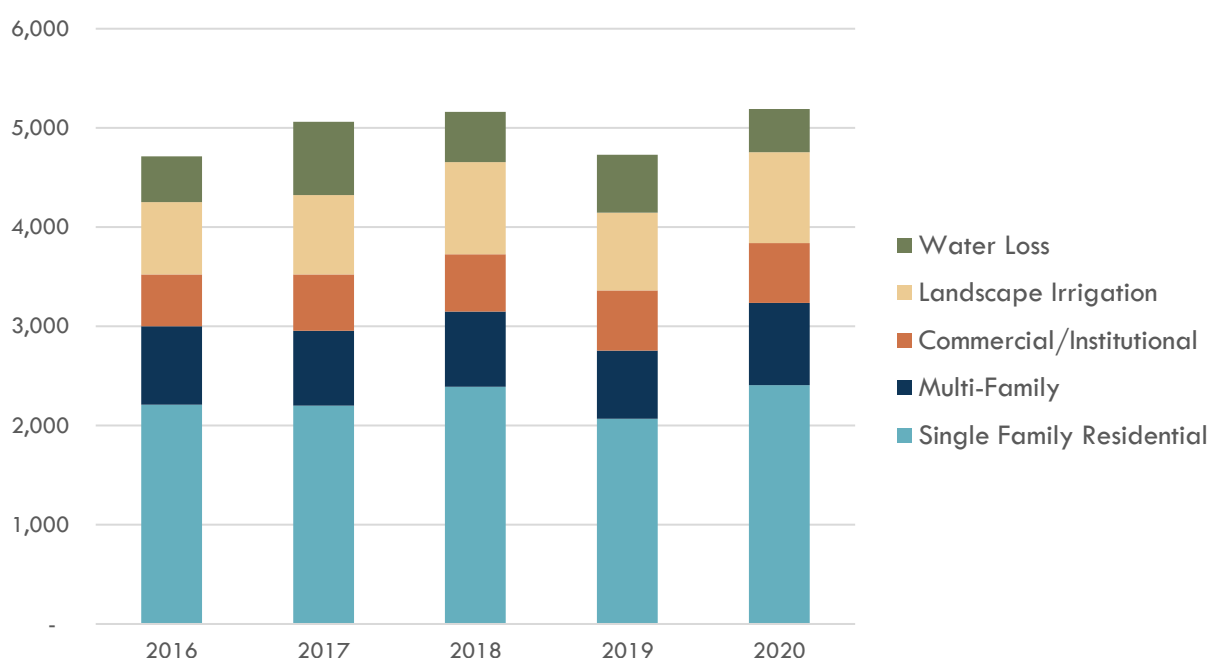
CUSTOMER CLASS	2016	2017	2018	2019	2020
Single Family Residential	4,505	4,585	4,565	4,594	4,794
Multi-Family	385	382	402	387	387
Commercial/Institutional	279	275	327	350	283
Landscape Irrigation	254	205	185	261	261
TOTAL	5,423	5,447	5,479	5,592	5,726

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.

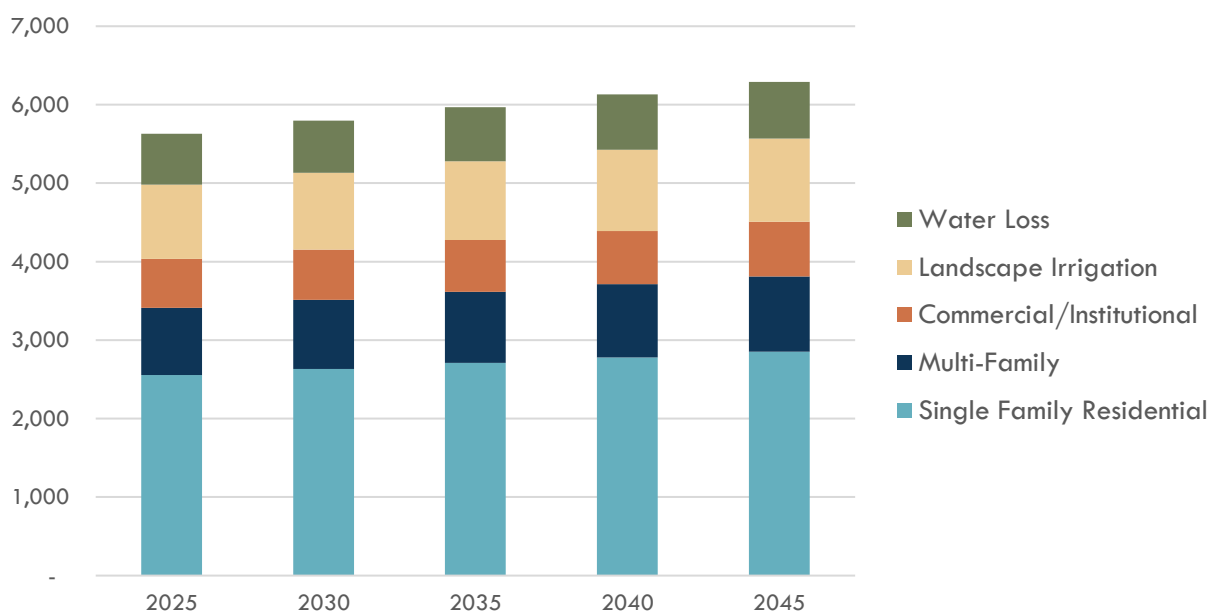
To estimate future water use for each customer category, the demand factor is multiplied by the number of estimated new connections and added to the 2020 use of existing customers in that category. This process is applied to each customer type, then all of the category results are added to estimate the 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)

CUSTOMER CLASS	PROJECTED WATER USE				
	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)

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2025	2030	2035	2040	2045
		REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME	REASONABLY AVAILABLE VOLUME
Groundwater (not desalinated)	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 1.5% 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

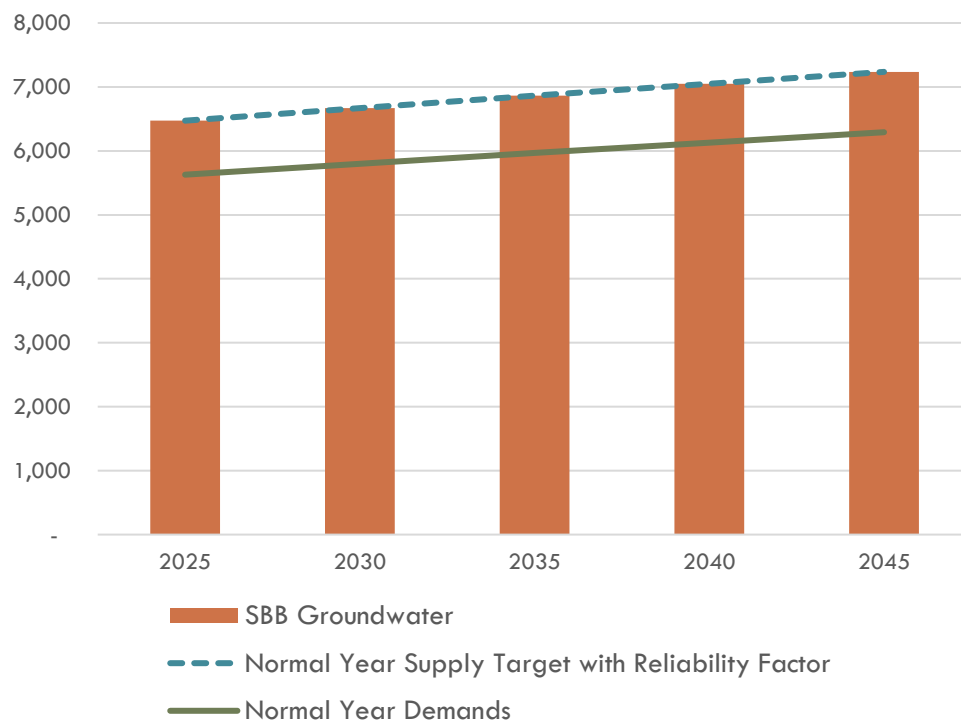


Figure 3-4: City of Loma Linda Projected Supply and Demand Comparison (AF)

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 Year	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
Second Year	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
Third Year	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
Fourth Year	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
Fifth Year	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

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 IRUWMP 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.