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CITY OF SOLEDAD 2020 URBAN WATER MANAGEMENT PLAN

July 2021

Harris & Associates

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ACRONYMS AND ABBREVIATIONS

°F	Fahrenheit
20x2020	20% water use reduction in GPCD by year 2020
AB	Assembly Bill
ACT	Urban Water Management Planning Act
AF	Acre-Feet
AFY	Acre-Feet per Year
AMBAG	Association of Monterey Bay Area of Governments
ASGSA	Arroyo Seco Groundwater Sustainability Agency
AWWA	American Water Works Association
BMP	Best Management Practice
CA	California
CalWEP	California Water Efficiency Partnership
CASGEM	California Statewide Groundwater Elevation Monitoring
CDCR	California Department of Corrections and Rehabilitation
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CII	Commercial/Industrial/Institutional and Governmental (for SMWD)
CIMIS	California Irrigation Management Information System
City	City of Soledad
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
CWP	California Water Plan
DAC	Disadvantaged Community
DMM	Demand Management Measure
DOF	State Department of Finance
Domestic Water	Potable Water
DRA	Drought Risk Assessment
DWR	Department of Water Resources
DWS	Drinking Water Standard
ET	Evapotranspiration
ETo	Reference Evapotranspiration
GHG	Greenhouse Gases
GMP	Groundwater Management Plan
GPCD	Gallons per Capita per Day
GPD	Gallons per Day
GPM	Gallons per Minute
GSA	Groundwater Sustainability Agency
GSP	Groundwater Sustainability Plan

GW	Groundwater
hcf	Hundred Cubic Feet
Interim Target	2015 GPCD Interim Target
IRWM	Integrated Regional Water Management
ISP	Integrated Sustainability Plan
IWA	International Water Association
JPA	Joint Powers Agreement
kWh	Kilowatt Hours
Legislature	State of California Legislature
MCL	Maximum Contaminant Level
MCWRA	Monterey County Water Resources Agency
MG	Million Gallons
mgd	Million Gallons per Day
mg/l	Milligrams per Liter
MHI	Median Household Income
MWELO	Model Water Efficient Landscape Ordinance
NO_3	Nitrate
NO_3-N	Nitrate as Nitrogen
RNHA	Regional Housing Needs Assessment
RWQCB	Regional Water Quality Control Board
SBX7-7	Senate Bill X7-7, The Water Conservation Act of 2009
SB	Senate Bill
SGMA	Sustainable Groundwater Management Act
SRF	Single Family Residential
SVBGSA	Salinas Valley Basin Groundwater Sustainability Agency
SVIHM	Salinas Valley Integrated Hydrologic Model
SVOM	Salinas Valley Operations Model
SWP	State Water Project
SWRCB	California State Water Resources Control Board
Target	2020 GPCD Target
USBR	United States Bureau of Reclamation
U.S. EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WAS	Water Audit Software, AWWA
Water Code	California Water Code
WRF	Water Reclamation Facility
WSCP or WSC Plan	Water Shortage Contingency Plan
WUE	Water Use Efficiency

EXECUTIVE SUMMARY

The City of Soledad's (City) 2020 Urban Water Management Plan (UWMP) is an update to its 2015 UWMP. The UWMP is a long-term resource planning document required by the State of California Water Code (CWC) Sections 10610–10657. It is updated by urban water suppliers every five years. The 2020 UWMP includes significant augmentation due to new requirements enacted by the State Legislature since 2015.

The UWMP presents the purpose of the Plan, coordinated planning with other agencies, how the plan was prepared, and a description of the City's water service area, climate, and demographics. The UWMP then gathers, characterizes, and synthesizes water-related information from numerous sources to assess and project the City's water reliability. The City's 2020 UWMP includes water reliability forecasts through the year 2045. It also acts as a guide to maintain efficient use of urban water supplies, promote conservation programs and policies, and proactively plan and update the City's strategies to ensure that water supplies are available to meet existing and future needs for the community.

This executive summary satisfies the new requirement of CWC Section 10630.5, which requires a simple lay description of the Plan to include a description of water supply and demand—how much water the City has and how much it uses. It also requires a summary of the City's strategy for meeting its water demands, the challenges facing the City, and other information necessary to provide a general understanding of the City's Plan.

ES.1 WATER USE

Potable water is water that is safe to drink. The City treats, tests, and publishes reports on its water to ensure it meets numerous federal and state drinking water regulations. The City provides this potable water to residential, commercial, industrial, institutional, and landscape customers within the City's service area. In 2020, water demand for potable and non-potable water totaled 2,264.26 acre feet (AF), as summarized in Table ES-1. "Single-Family" and "Multi-Family" are residential homes. "Single-Family" means a residence that houses one family. "Multi-Family" refers to duplexes, apartments, and condominiums.

The "Losses" in Table ES-1 refers to water losses in the distribution system. The distribution system is the system of underground pipes, pumps, and components that deliver drinking water to the City. Distribution system water losses in 2020 were estimated to be 179.65 AF.

TABLE ES-1: 2020 DEMAND FOR POTABLE WATER

USE TYPE	2020 ACTUAL		
	ADDITIONAL DESCRIPTION, AS NEEDED	LEVEL OF TREATMENT WHEN DELIVERED	VOLUME (AF)
Single Family	Residential	Drinking Water	1,333.98
Multi-Family	Residential	Drinking Water	275.82
Commercial		Drinking Water	125.54
Industrial		Drinking Water	3.78
Institutional/Governmental		Drinking Water	219.04
Landscape		Drinking Water	79.15
Other Potable	Hydrant	Drinking Water	24.52
Other Potable	Authorized Unbilled	Drinking Water	22.78
Losses		Drinking Water	179.65
		TOTAL	**2,264.26**

ES.2 WATER SUPPLY

The City currently relies on groundwater for 100 percent of its water supply. The City pumped 2,264 AF of water from the groundwater basin in 2020 to meet demands. By 2025, the City expects to incorporate the use of recycled water for irrigation, ball fields, and open space uses only.

City wells tap into water from the groundwater basin called the Forebay Subarea of the Forebay Aquifer Subbasin, which, in turn, is a part of the Salinas Valley Groundwater Basin. The groundwater levels in the Forebay Subarea are historically characterized by general stability. This stability is due in part to the Forebay Subarea's location just downstream of the confluence of the Salinas River and the Arroyo Seco groundwater subarea and due in part to proactive management of the Salinas Valley Groundwater Basin by the Monterey County Water Resources Agency (MCWRA). Water conservation has also played an important part in maintaining the stability of the basin.

Historically, the Forebay Subarea has adequately met the City's water demands, and with responsible management, it is anticipated that it will continue to adequately meet the City's water demands in the future.

ES.3 CALIFORNIA WATER CONSERVATION ACT (SBX7-7)

California Senate Bill X7-7, enacted in 2009, required a reduction in per-person water use of 20 percent by 2020. The City's 2020 target water use was 117 gallons per person per day. This means that each person should use no more than 117 gallons of water each day. The City met its target water use. Residents used an average of 114 gallons each day.

ES.4 DROUGHT RISK ASSESSMENT AND EMERGENCY WATER SHORTAGES

Water service reliability addresses the capability of the water supply to meet water demand during long-term droughts and emergency events in normal (average) existing conditions. One of the primary purposes of the UWMP is to have water suppliers determine if water supplies will be reliable during average years, a single dry year, and a five-year consecutive drought. A drought risk assessment was prepared by the City to ensure water service reliability. With continued effective water management strategies, the City is projected to have 100 percent water reliability in a single year or five consecutive year drought. Projections assume that City residents and businesses continue to conserve water and increase conservation rates during droughts, as outlined in Chapter 7.

An earthquake, prolonged power outage, or other event could cause an emergency water shortage and severely impact water reliability. For a water shortage, the City of Soledad Water Shortage Contingency Plan (WSCP/WSC Plan) will serve as the City's operating plan to prevent catastrophic water service disruptions through proactive, rather than reactive, mitigation of water shortages. The WSCP includes the processes and procedures that will be deployed when shortage conditions arise as summarized in Chapter 8. These procedures set the foundation for the City Council, City management, and staff to easily identify and efficiently implement pre-determined steps to mitigate a water shortage to the level appropriate to the degree of water shortage anticipated.

The WSCP establishes levels of water shortage (six levels) and the corresponding shortage response actions the City will take and require of its customers. The response actions are designed to help balance water demand with available supplies. The WSCP is a stand-alone plan (Appendix I) that can be updated separately, as-needed, from this UWMP.

ES.5 STRATEGIES AND CHALLENGES FOR MANAGING RELIABILITY RISKS

Demand management is a key strategy in the City's plan to managing water resources. As the City grows and population increases, water demand typically increases. However, the City's demand management measures (DMMs) promote the efficient use of water by the community. DMMs are discussed in detail in Chapter 9 and summarized below:

- **Water waste prevention ordinances** The City has established Mandatory Water Conservation Regulations. The regulations aim to establish water conservation as a way of life—even during years of normal average rainfall. Additionally, the City's building code requires water-efficient landscaping for all new construction.
- **Metering** Every water connection except for fire service is metered. Any significant increase in water usage is flagged, and the City contacts the user to communicate the likelihood of a probable leak.
- **Conservation Pricing** Water billing rates encourage water conservation through a tiered rate structure. Each single-family residential water account pays both a flat rate

based on meter size and a volume-based rate based on amount of water used. The volume-based rate incorporates higher rates for higher usage tiers.

- **Public Education and Outreach** The City has undertaken multiple public information programs to help reduce water consumption, raise public awareness of methods of water conservation, and incentivize replacement of high water use fixtures through both optional and mandated fixture replacement programs.
- **Programs to Assess and Manage Distribution System Real Loss** The City performs leak detection to identify water losses, whether on private property or City-owned pipes, and maintains a program to repair and replace City-owned water infrastructure.
- **Water Conservation Program Coordination and Staffing Support** The Public Works Manager for Utilities is responsible for coordinating water conservation efforts.

In addition to the above demand management activities, the City will augment supply with recycled water. Effective in 2021/22, the City's Water Reclamation Facility will provide all irrigation water to one of the City's parks. In the future, it is projected that most landscaping water demand will be met through recycled water delivery.

With the City's strong water reliability, it is easy to become complacent with respect to water conservation. However, it is important that the City's residents continue to conserve water. Starting in 2023, the California Legislature will require that residents reduce indoor water use to the following upper limits:

- 55 GPCD until 1/1/2025
- <=52.5 GPCD until 1/1/30
- <=50 GPCD thereafter

The Department of Water Resources (DWR) will propose and implement methodologies for tracking and reporting indoor residential water for 2023. The City is preparing to meet these tracking and reporting requirements. The community's commitment to water conservation and demand management measures will need to ensure that indoor residential water use meets the legislated water use objectives.

ES.6 PLAN ADOPTION AND SUBMITTAL

As required by the CWC, the City notified the Cities of Gonzales and Greenfield and the County of Monterey, along with other stakeholders in the community, that it was updating its UWMP and its WSCP. The City also notified the same agencies that a public hearing by the City Council would be held before adoption of each plan.

The City encouraged community and public interest involvement in the UWMP update through inspection of the Draft UWMP and the Draft WSCP and through participation in the public hearing. The City posted the draft plans on its website, appropriately published the public hearing notification, and held the public hearing on July 21, 2021.

The City Council adopted each plan by resolution and submitted them to the DWR and made the Final UWMP and Final WSCP publicly available on the City's webpage.

1 INTRODUCTION AND OVERVIEW

1.1 BACKGROUND, IMPORTANCE, AND PURPOSE

Water planning is an essential function of water suppliers and is critical as California struggles with ongoing drought and expected long-term climate changes. Prior to the adoption of the Urban Water Management Planning Act[1] (Act), there were no specific requirements that water agencies conduct long-term resource planning.

Originally enacted in 1983, the Act ensures that urban water suppliers are proactively reviewing and managing water reliability, and also requires and provides the substance for the California Department of Water Resources (DWR) reporting to the State of California Legislature (Legislature) on the status of water supply planning in California. The drought of 1976–1977 created severe water supply shortages throughout California. With several cities and water districts/agencies witnessing reduction in their water supplies and having to look for additional water sources elsewhere, an immediate need arose for a statewide, local-level, long-term water management planning platform. To address and reduce the potential for future emergencies caused by inadequate water resource planning, the Act was proposed and adopted in 1983.

The Act has been modified over the years in response to the state's water shortages, droughts, and other factors. A significant amendment was made in 2009, after the drought of 2007–2009 and as a result of the Governor's call for a statewide 20 percent reduction in urban water use by the year 2020. This was the Water Conservation Act of 2009, also known as SBX7-7. This Act required agencies to establish water use targets for 2015 and 2020 that would result in statewide savings of 20 percent by 2020.

The Urban Water Management Plan (UWMP or Plan) is the legal and technical water management foundation for water suppliers throughout California. The UWMP gathers, characterizes, and synthesizes water-related information from numerous sources into a plan with local, regional, and statewide practical utility. This City of Soledad 2020 UWMP provides a framework for long-term water planning and informs the public of the City's plans for long-term resource planning to ensure adequate water supplies for existing and future demands. The UWMP documents the availability of an appropriate level of reliability of water service sufficient to meet the needs of the City's customers during normal, single-dry, and multiple-dry years. This 2020 UWMP also identifies if the City has met its 2020 target. A long-term, reliable supply of water is essential to protect the productivity of the city's and California's businesses and economic climate.

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[1] California Water Code Section 10610–10657 Codes: Code Search (ca.gov).

1.2 URBAN WATER MANAGEMENT PLANNING AND THE CALIFORNIA WATER CODE

In addressing urban water management issues, the Legislature has made a number of significant declarations, including the following:

- The waters of the state are a limited and renewable resource subject to ever-increasing demands.
- Conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
- A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.
- As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple-dry water years.
- Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
- Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins' water quality objectives and promoting beneficial use of recycled water.
- Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
- Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
- The quality of source supplies can have a significant impact on water management strategies and supply reliability.

The Legislature also finds and declares that the following is the policy of the state:

- The management of urban water demand and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
- The management of urban water demand and efficient use of urban water supplies shall be a guiding criterion in public decisions.
- Urban water suppliers shall be required to develop water management plans to achieve the efficient use of available supplies and strengthen local drought planning.

California Water Code (CWC) Sections 10608–10657 are directly relevant to preparation of the UWMP. These sections include the Act and the Sustainable Water Use and Demand Reduction (SBX7-7) requirements. The CWC Section 10644 requires each urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually to update its UWMP at least every five years on or before July 1 in years ending in six and one, incorporating updated and new information from the five years preceding each update. The 2020 UWMP update is due to DWR by July 1, 2021.

The purpose of the UWMP is to integrate water supply and demand in a methodical planning platform to address short- and long-term water reliability. Specifically, the UWMP provides water supply planning for a 25-year planning period in five-year increments and identifies water supplies needed to meet existing and future demands. The demand analysis must identify supply reliability under three hydrologic conditions: a normal year, a single-dry year, and multiple-dry years. Enhanced water reliability planning encompasses the following:

- Changes in natural hydrology, climate, and groundwater conditions.
- Implications of regional, state, and federal regulations.
- Supply conditions and water use variability.
- Regional constraints on or opportunities for shared water resources.
- Local land use changes, development, plans, and population growth.
- Water shortages and unforeseen calamities.
- Infrastructure improvements.
- Project funding needs and opportunities.

Since the Act was passed, it has undergone significant expansion and revision. Prolonged droughts, groundwater overdraft, regulatory revisions, and changing climatic conditions not only affect each supplier’s water reliability determinations, but also the broad picture of statewide water reliability overseen by DWR, the State Water Resources Control Board (State Water Board), and the Legislature. Accordingly, the Act has grown to address changing conditions as it guides California’s water resource management.

1.3 NEW REQUIREMENTS

In 2015 and again in 2020, DWR published an extensive Urban Water Management Plan Guidebook. The Legislature passed a number of additional requirements for the 2020 UWMP, which are included in the 2020 UWMP Guidebook and are included in Soledad’s 2020 UWMP. Highlights of the new requirements include the following:

- **Five Consecutive Dry-Year Water Reliability Assessment** The Legislature modified the dry-year water reliability planning from a “multiyear” time period to a “drought lasting five consecutive water years” designation. This statutory change requires a supplier to analyze the reliability of its water supplies to meet its water use over an extended drought period.
- **Drought Risk Assessment** The Drought Risk Assessment (DRA) requires a supplier to assess water supply reliability over a five-year period from 2021 to 2025 that examines water supplies, water uses, and the resulting water supply reliability under a reasonable prediction for five consecutive dry years.
- **Seismic Risk** Suppliers must address seismic risk to their water infrastructure.

- **Water Shortage Contingency Plan Updates** Soledad's 2015 UWMP contained a Water Shortage Contingency Plan; however, 2018 legislative changes require modifications/ enhancements to this Plan.
- **Groundwater Supplies Coordination** 2020 UWMPs should be consistent with Groundwater Sustainability Plans, in areas where those plans have been completed by Groundwater Sustainability Agencies.
- **Lay Description** The Legislature included a new statutory requirement for suppliers to include a lay description of the fundamental determinations of the UWMP, especially regarding water service reliability, challenges ahead, and strategies for managing reliability risks. This UWMP includes the lay description in the Executive Summary.

1.4 URBAN WATER MANAGEMENT PLANS IN RELATION TO OTHER PLANNING EFFORTS

Development of the City's UWMP has been prepared in coordination with other planning efforts and agencies. The City's General Plan, specifically the Land Use Element and the Housing Element, has been used to inform specific growth and socioeconomic elements within the city for water use projections. The City's Water System Master Plan, Water Reclamation Facility plans and documents, Stormwater Management Plan, and other similar planning documents have been referred to. Regional documents, including the Monterey County Groundwater Management Plan; management and planning efforts of the Salinas Valley Basin Groundwater Sustainability Agency, including information developed to date for the Forebay Aquifer Subbasin Groundwater Sustainability Plan and the Valley-Wide Integrated Groundwater Sustainability Plan; the Integrated Regional Water Management Plan for Greater Monterey County; and the Monterey County Multi-Jurisdictional Hazard Mitigation Plan, were also used.

These documents have been used to incorporate information that supports the City's urban water management planning in the city and to ensure a holistic and consistent planning process in the region.

1.5 PLAN ORGANIZATION

The City's 2020 UWMP has been prepared in compliance with the requirements of the Act, as amended to 2020,[2] and included in the CWC. The City's UWMP is organized as follows:

Executive Summary: Includes a lay description summary of key information regarding the fundamental determinations of the UWMP, particularly water service reliability, challenges ahead, and strategies for management of reliability risks. This is a go-to synopsis for anyone desiring a quick overview of the 2020 UWMP.

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[2] California Water Code, Division 6, Part 2.6, Section 10610, et seq. Established by Assembly Bill 797 (1983), https://leginfo.legislature.ca.gov/faces/codes_displayexpandedbranch.xhtml?tocCode=WAT&division=6.&title=&part=&chapter=&article (Accessed 2/5/2021).

Chapter 1 – Introduction and Overview: Introduces the importance and extent of the City's water management planning efforts and this Plan organization.

Chapter 2 – Plan Preparation: Includes the City's process for developing this UWMP, including efforts in coordination and outreach.

Chapter 3 – Water System and Service Area Description: Presents a description and map of the City's water service area, the City's history and organizational structure, the Public Water System, climate data and potential effects of climate change, and population and demographics.

Chapter 4 – Water Use Characterization: Describes and quantifies the current and projected water uses in normal conditions within the City's service area.

Chapter 5 – SBX7-7 Baselines and Targets: Describes the City's methodology for calculating its baseline and target water consumption, and identifies compliance by achieving its 2020 water use target.

Chapter 6 – Water Supply Characterization: Describes and quantifies the current and projected water sources available to the City, including water volumes for average year conditions, origin of water supply, water quality, issues unique to the supply, management actions and projects that are anticipated to meet future water demand, and climate change impacts on supply.

Chapter 7 – Water Service Reliability and Drought Risk Assessment: Describes the reliability of the City's water supply, and projects water reliability for a 25-year planning horizon for normal, single-dry years, and five consecutive dry years. Includes an analysis of the City's water reliability risk to drought.

Chapter 8 – Water Shortage Contingency Plan: Describes the City's staged plan for responding to water shortages, including a catastrophic supply interruption. Includes shortage response actions, communication protocols, enforcement, reporting, and refinement procedures.

Chapter 9 – Demand Management Measures: Demonstrates the City's efforts to promote water conservation and to reduce demand on its water supply, specifically detailing efforts for designated demand management measures. The demand management measures include those the City has implemented or is considering implementing pursuant to the requirements of the Act.

Chapter 10 – Plan Adoption and Submittal: Describes the City's actions taken to provide notification to agencies, adopt and submit the UWMP to DWR, and make it available to the public and the process to amend the adopted UWMP, if needed.

The chapters in this UWMP correspond to the outline of the Act and as recommended in the DWR 2020 Guidebook for Urban Water Suppliers. Further, the tables included are required by DWR and in the format presented in the 2020 Guidebook. They are both inclusive in the UWMP and submitted to DWR as a separate Excel file through the online WUEdata Portal. The DWR Urban Water Management Plan Checklist form from the Guidebook has been completed and is included in Appendix A. The Checklist identifies the location in this UWMP where required elements can be found.

The UWMP is intended to serve as a general, flexible, and open-ended document that periodically can be updated to reflect changes in regional water supply trends and water use efficiency policies. The City's UWMP, along with other City planning documents, will be used by City staff to guide water use and management efforts through the year 2025, when the UWMP is required to be updated.

2 PLAN PREPARATION

The Urban Water Management Planning Act requires that a description be provided for the process that was used for the preparation of the UWMP. This chapter provides the legal requirement to prepare this Plan, the option of regional planning, and the coordination and outreach related to this Plan. The chapter also includes images of related reporting tables that are required by DWR.

2.1 BASIS FOR PREPARING A PLAN

At year-end 2020, the City of Soledad served more than 3,000 water connections and, thus, continued to qualify as an urban water supplier subject to the legislated requirements to prepare an urban water management plan. The City first prepared its UWMP in 2006, has updated it every five years, and is now required to update its 2015 UWMP and submit it to DWR by July 1, 2021.

Table 2-1 shows the City's 2020 water system information and size.

TABLE 2-1: RETAIL ONLY – PUBLIC WATER SYSTEM

PUBLIC WATER SYSTEM NUMBER	PUBLIC WATER SYSTEM NAME	NUMBER OF MUNICIPAL CONNECTIONS 2020	TOTAL VOLUME OF WATER SUPPLIED 2020 (AF)
CA2710011	City of Soledad	4,078	2,264
	TOTAL	**4,078**	**2,264**

2.2 INDIVIDUAL OR REGIONAL PLANNING

An urban water supplier may elect to submit an individual UWMP or may work with other entities to provide a regional plan. The City communicates regularly with related water supply stakeholders; however, for the purposes of the UWMP, the City reports solely on the City's service area and is not a part of a regional alliance or regional urban water management plan, as shown in Table 2-2.

TABLE 2-2: PLAN IDENTIFICATION

SELECT ONLY ONE	TYPE OF PLAN	NAME OF RUWMP OR REGIONAL ALLIANCE
☑	Individual UWMP	
☐	Regional Urban Water Management Plan (RUWMP)	

2.3 TYPE OF AGENCY, CALENDAR YEAR, AND UNITS OF MEASURE

Table 2-3 identifies the City as a retail urban water supplier, reports its UWMP data in calendar years, and measures its water in acre-feet (AF).

TABLE 2-3: SUPPLIER IDENTIFICATION

TYPE OF AGENCY	
☐	Agency is a Wholesaler
☑	Agency is a Retailer
FISCAL OR CALENDAR YEAR	
☑	UWMP Tables are in Calendar Years
☐	UWMP Tables are in Fiscal Years
UNITS OF MEASURE USED IN UWMP	
Unit	AF

2.4 COORDINATION AND OUTREACH

The City's UWMP was developed in collaboration with regional planning agencies and documents, as noted in Chapter 1. The City also provided opportunities for the public to understand the UWMP update process, provide input, review and comment on the Draft UWMP, and participate in a public hearing. Table 2-4 summarizes external coordination and outreach activities carried out by the City and their corresponding dates.

TABLE 2-4: EXTERNAL COORDINATION AND OUTREACH

	DATE	REFERENCE
Notified city or county within supplier's service area that water supplier is preparing an updated UWMP (at least 60 days prior to public hearing)	12/28/20	Appendix J
Encouraged public involvement – Posted on City webpage with notice Draft UWMP and Draft WSCP available for review	7/7/21	Chapter 10
Encouraged public involvement – Public hearing notice for UWMP and WSCP	6/16/21	Appendix K
Held public hearing and adopted UWMP and WSCP	6/16/21	Appendix L
Submitted UWMP and WSCP to DWR	8/1/21	Chapter 10
Submitted UWMP and WSCP to the California State Library and city or county within the supplier's service area, and made available for public review	8/1/21	Chapter 10
Made UWMP and WSCP available for public review within 30 days after adoption	8/1/21	Chapter 10

Table 2-5 lists the entities that the City coordinated with in the development of its 2020 UWMP. The City does not purchase wholesale water and, thus, did not provide information to any wholesale water suppliers.

TABLE 2-5: UWMP DEVELOPMENT, COORDINATION, AND PUBLIC INVOLVEMENT

AGENCY	SENT 60-DAY NOTICE LETTER	PARTICIPATED IN UWMP/ WSCP PREPARATION	USED AGENCY DATA AS AN INFORMATION RESOURCE	SENT AND/OR AVAILABLE TO: COPY OF DRAFT UWMP/ WSCP	COMMENTED ON DRAFT UWMP/ WSCP	SENT NOTICE OF PUBLIC HEARING	ATTENDED PUBLIC HEARING
City of Gonzales	√			√		√	
City of Greenfield	√			√		√	
County of Monterey	√			√		√	
Greater Monterey County Integrated Regional Water Management Program	√		√	√		√	
Monterey County Water Resources Agency	√		√	√		√	
Monterey County Water Awareness Committee	√		√	√		√	
Salinas Valley Basin Groundwater Sustainability Agency	√		√	√		√	
Soledad Unified School District	√			√		√	
California Dept. of Corrections and Rehabilitation				√			
Camphora Apartments	√			√		√	
Dole Fresh Vegetables	√			√		√	
Estancia Estates Winery	√			√		√	
Golden State Vintners	√			√		√	
General Public				√		√	√

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3 WATER SYSTEM AND SERVICE AREA DESCRIPTION

This chapter provides a description of the City of Soledad's geographic location, its water service area, current climate and potential climate change in the region, population and demographic data, and current and proposed land use data.

3.1 GENERAL DESCRIPTION

The City of Soledad traces its beginning to the original Mission Spanish land grants of the eighteenth century. The thirteenth of California's Spanish missions, Misión Nuestra Señora de la Soledad (Mission of Our Lady of Solitude, or Mission Soledad), was founded on October 9, 1791. Surrounded by prime farmland, Soledad attracted the Southern Pacific Railroad in 1872. The Township of Soledad was established in 1876, and the City of Soledad was formally incorporated in 1921.

As shown in Figure 3-1, Soledad is located in Monterey County, approximately 25 miles southeast of the City of Salinas and five miles southwest of Pinnacles National Park in the Gabilan Mountain Range. The City's closest neighbor, the City of Gonzales, is located approximately eight miles to the northwest. Highway 101 runs along the southwestern boundary of the city.

Not all portions of the city are contiguous. The map in Figure 3-2 delineates city boundaries in red. The city's legal boundaries encompass areas not served by the water system. For instance, the California Department of Corrections and Rehabilitation (CDCR) operates three prisons, the Gabilan Fire Camp, the Correctional Training Facility, and the Salinas Valley State Prison, within the city limits.

The City does not provide water service to the prisons but does provide wastewater service. These correctional facilities' water is supplied from their own wells. The Correctional Training Facility has three wells and provides water to the Gabilan Fire Camp through a meter. The Salinas Valley State Prison has two wells.

The City provides wastewater services to the facilities; all of the correctional facilities' wastewater flow is conveyed to the City's Water Reclamation Facility (WRF).

The correctional facilities are not included in any population or water demand projections contained in this UWMP.

3.2 SERVICE AREA AND BOUNDARY MAP

The City's water service area, from the City of Soledad 2019 Water System Master Plan, is shown in Figure 3-3. This map delineates the current distribution network.

The City of Soledad provides water service to areas within the city through a system of municipal wells, water treatment, aboveground storage, and distribution pipes, which provide water to all areas of the city. The distribution system is organized into three pressure zones: Zone A, Zone B, and Zone C. Zone A serves elevations between 180 feet and 237 feet generally south of Gabilan Drive, Zone B serves elevations between 195 feet and 308 feet generally north of Gabilan Drive, and Zone C serves elevations between 223 feet and 238 feet in the vicinity of the intersection of Metz Road and Tiburon Place.

The City has sufficient water capacity for all areas within the existing city limits and within some areas designated for growth by the 2005 General Plan. Specifically, the Water System Master Plan indicates that an average daily demand of approximately 3,190 gallons per minute (gpm) would be required to serve existing and new development in either the proposed (Miravale III Specific Plan) or already approved (Miravale II) areas; this demand falls within the system's total supply capacity of 5,200 gpm. The City has been proactive with respect to improving and developing its water supply system and continues to construct new wells in advance of demand.

The City of Soledad also maintains and operates a wastewater collection system that serves all properties within the city, including two state prison facilities, and a nearby agricultural processing facility on Camphora-Gloria Road outside the city limits. The City improved its sanitary sewer system in the last 10 years to increase capacity and provide tertiary treatment of wastewater. These improvements increased sewer treatment capacity to 5.5 million gallons per day (mgd), allowing for additional growth beyond the current city limits. The City of Soledad's unused sewer capacity is sufficient to accommodate housing development on the city's vacant and underutilized residential sites.

3.3 SERVICE AREA CLIMATE DATA AND POTENTIAL EFFECTS OF CLIMATE CHANGE

Located in the Salinas Valley, the City of Soledad has historically had a Mediterranean climate due to its proximity to the Pacific Ocean. The mean annual temperature in the city is 59.4 degrees Fahrenheit (°F), with the hottest month being August at approximately 85°F for the average high and the coldest month being December, with an average low of 48°F. High temperatures for the year average at 77.4°F, and low temperatures average annually at 41.4°F.

Yearly extremes in temperature vary, with the peak high rising to above 100°F and winter lows receding to the 30°F range. The city has a historical average annual rainfall of approximately 10 inches, with the majority of the rainfall occurring from November to March. These months typically see between one and three inches of rain each. The average annual evapotranspiration (Eto) is 51.9 inches.

There is scientific evidence that global climate conditions are changing and will continue to change due to continued buildup of greenhouse gases (GHGs) in Earth's atmosphere. Climate change is expected to affect temperature; storm intensity; flooding, riparian, and aquatic habitat and ecosystems; and seawater intrusion. Changes in climate can affect water supply and water quality through modifications in the timing, amount, and form of precipitation. Increased temperatures also influence water supplies through ETo and increased water demands—particularly for agriculture.

FIGURE 3-1: CITY OF SOLEDAD'S REGIONAL LOCATION

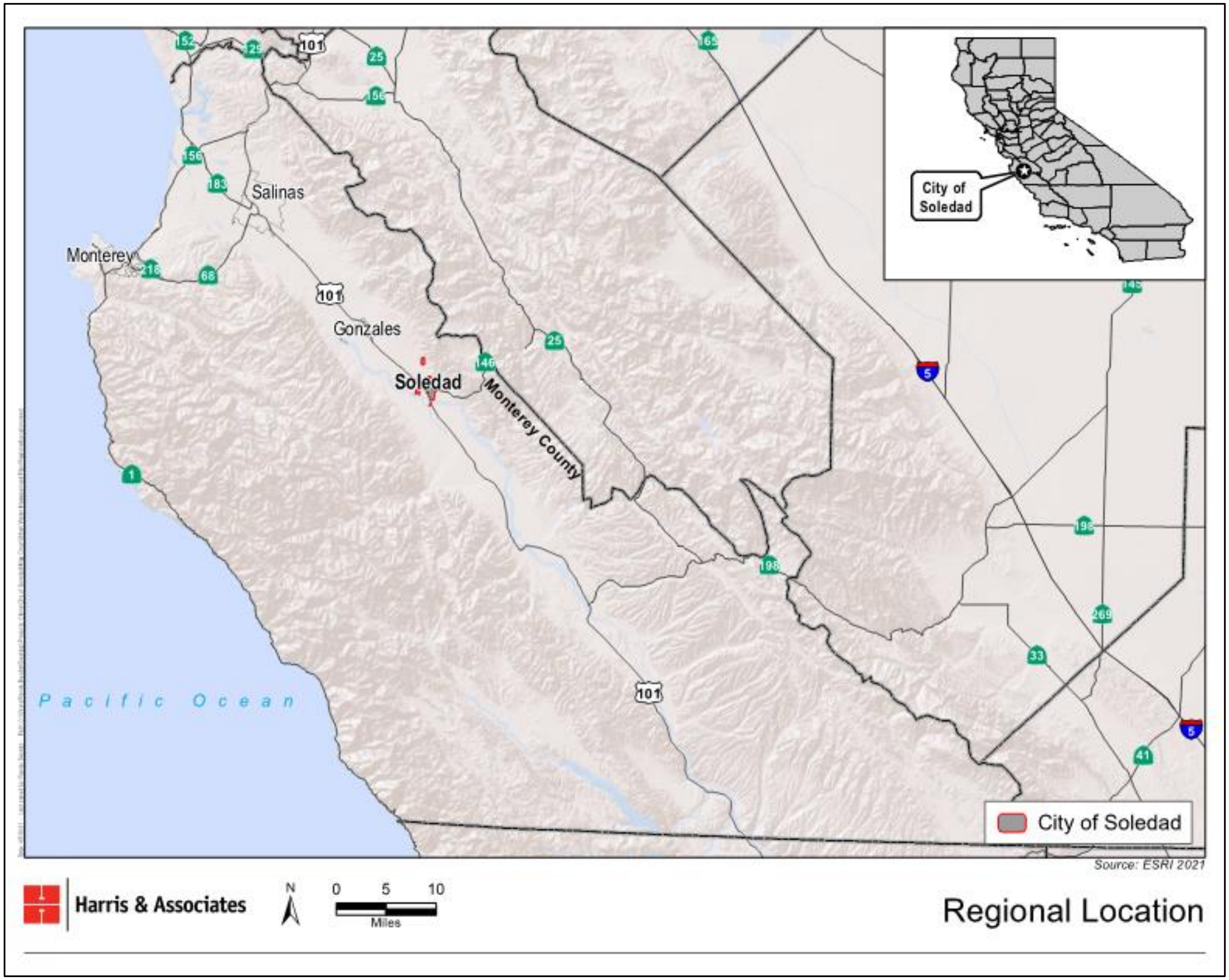


FIGURE 3-2: CITY OF SOLEDAD LOCATION MAP (CITY BOUNDARIES OUTLINED IN RED)

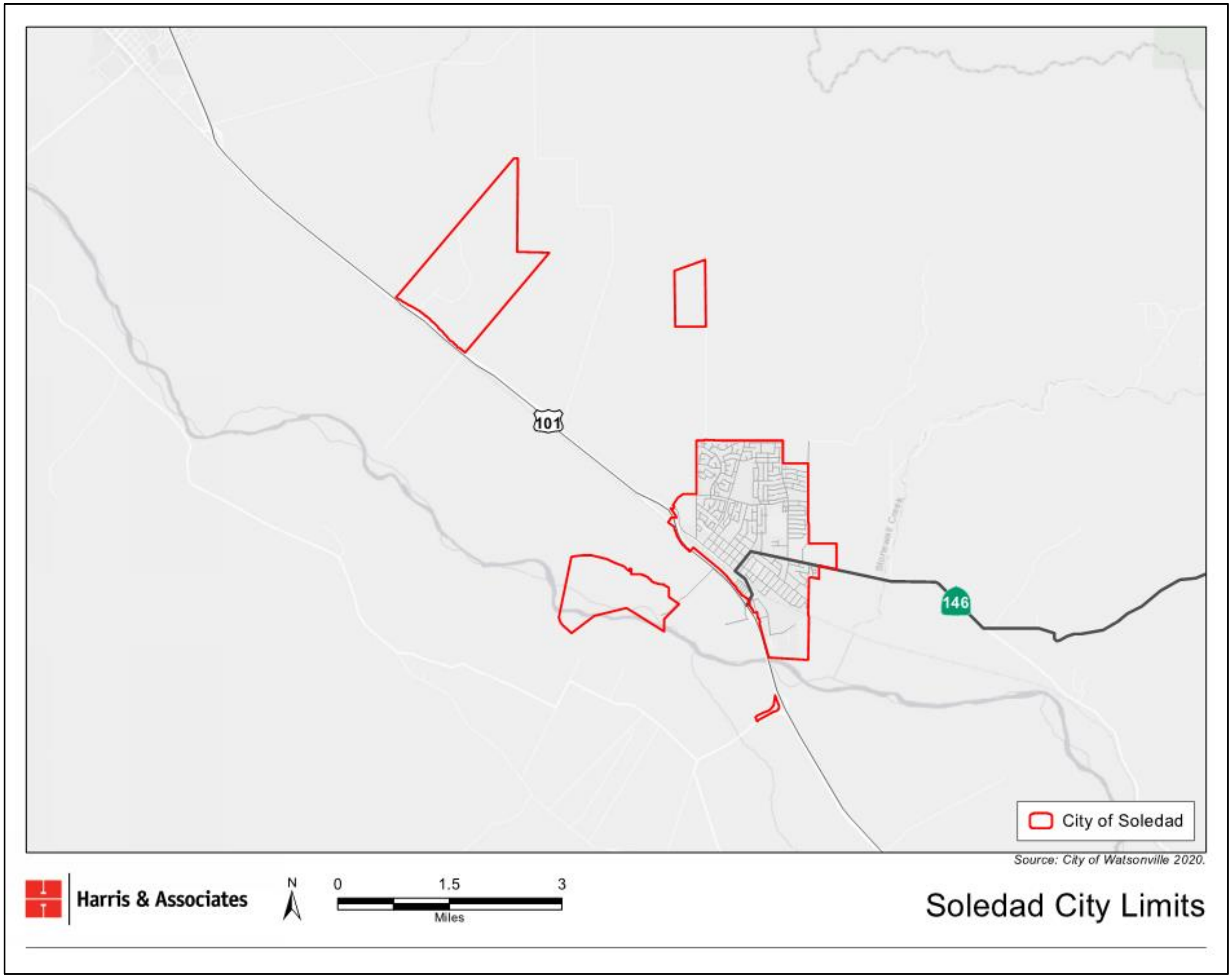
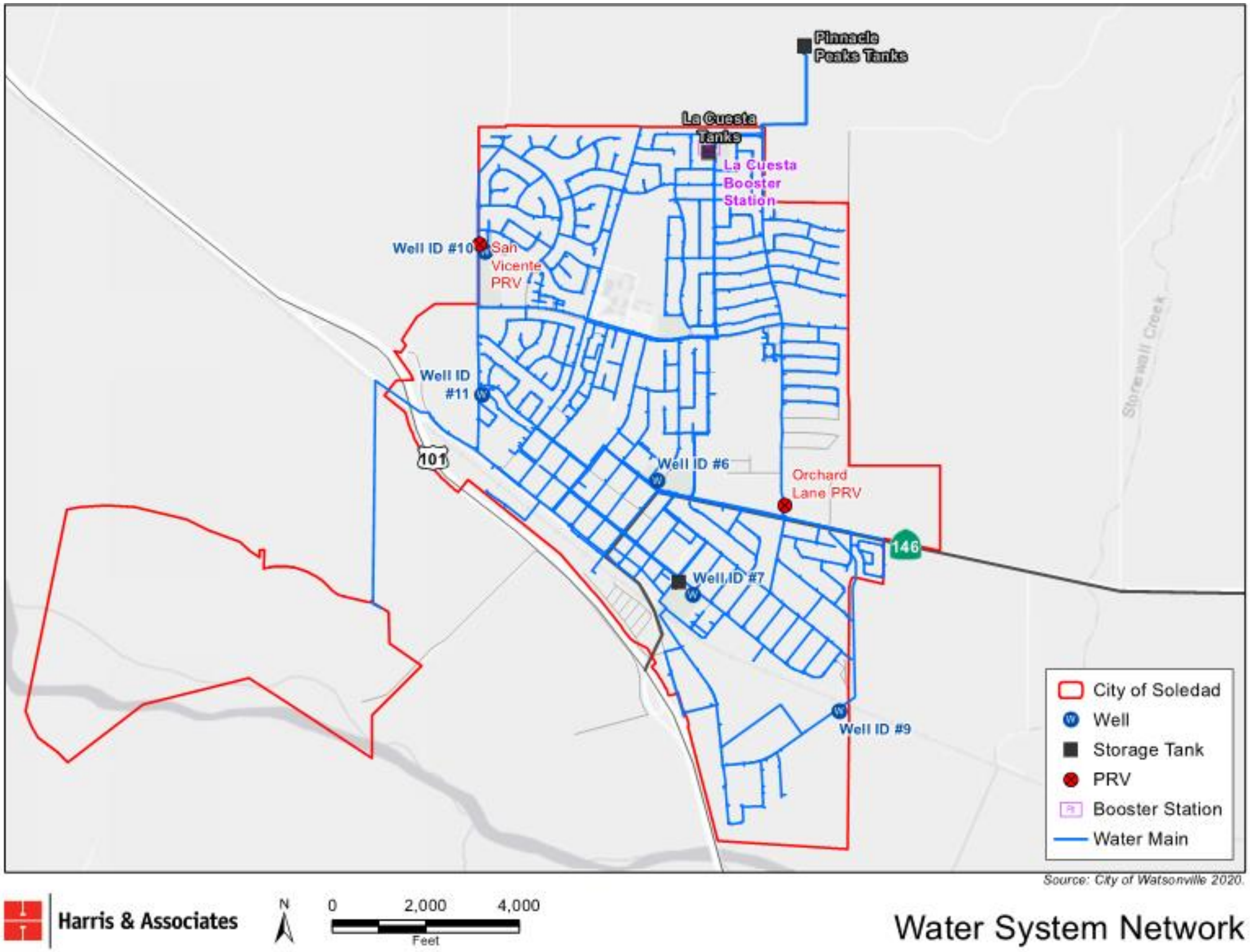


FIGURE 3-3: CITY OF SOLEDAD WATER SERVICE AREA



The seasonal variability of water demand is projected to increase with climate change as droughts become more common and more severe. Warmer temperatures increase ETo rates while extending the length of growing seasons, resulting in an overall increase in agricultural water demands. Some crops are more climate sensitive and may require more water to maintain yield and quality in future years. Streamflow volumes needed to support habitat (environmental water demand) may also be impacted by increased temperatures. Climate change is also projected to impact seasonal water demands, such as landscape irrigation.

Surface water sources are more vulnerable to drought events. Because the city can fully rely on groundwater, it is somewhat less susceptible to drought impacts. However, surface waters recharge aquifers; thus, the city could be vulnerable to a particularly severe and prolonged drought.

3.4 SERVICE AREA POPULATION AND DEMOGRAPHICS

3.4.1 POPULATION

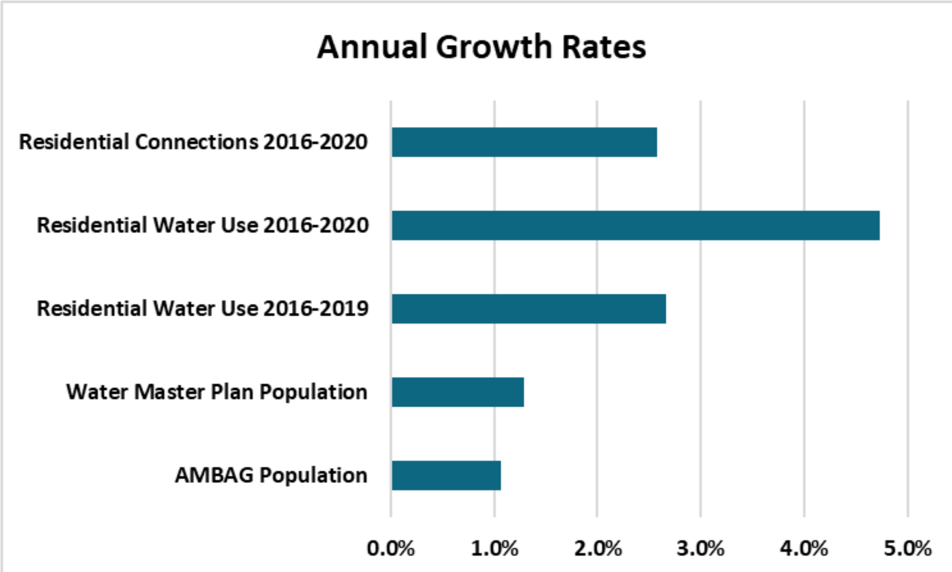
The city is a growing community, with about four percent of the Monterey County population residing within the city limits. The city has experienced strong population growth over the last four decades, almost tripling from about 5,950 people in 1980 to an estimated 16,455 people in 2015, per the 2015 UWMP. This represented a 2.9 percent annual growth rate.

Deriving population figures for the water service area is complicated by the presence of the correctional facilities, which are not in the water service area. Most state agency and census population estimates include the correctional facilities. Two sources exclude these facilities: Association of Monterey Bay Area of Governments (AMBAG) and the Water System Master Plan.

Growth rates from AMBAG and the Water System Master Plan are compared to growth rates for residential water use and residential connections in Figure 3-4. The number of residential connections increased 2.6 percent per year from January 2016 to January 2020. This is perhaps the strongest indication of population increases. Residential water use increased 4.7 percent from 2016 to 2020; however, 2020 was a high year. Residential water use increased 2.7 percent per year from 2016 to 2019.

Based on growth in water usage and connections, population growth rates in both AMBAG and the Water System Master Plan appear low. For the purposes of this UWMP, the Water System Master Plan population estimate was used as it was more reflective of the growth seen in residential water use and total connections. Moreover, the Water System Master Plan uses more effective data for projecting future population growth based on the potential buildout of the city.

FIGURE 3-4: GROWTH RATE COMPARISONS FOR POPULATION PROJECTIONS



The Water System Master Plan's 2020 population estimate is 17,789 people.[1] Based on City development plans and vacant land available, the Water System Master Plan used a total built-out population of 21,352 people by 2050. Based on a population logistics curve, shown in Figure 3-5, the Water System Master Plan estimates population growth in five-year increments through 2050.

The Water System Master Plan did not include the Miramonte development. The Miramonte development is a significant development that is outside current city limits and the water service area; however, the City plans to annex and develop the area. Therefore, population projections included in this UWMP for 2025–2045 are based on full buildout of Miramonte from 2035 to 2045, as well as other developments, which are discussed in Section 3.4.3 below. 2020 estimated people per household and estimated growth in connections (based on development) were used to project population growth rates through 2045. Results are presented in Table 3-1.

The City does not provide water service to the correction facilities; therefore, they are not included in the population numbers in Table 3-1. Population figures for the correctional facilities are estimated to be about 8,111 in 2020.

[1] Historical population data for the Water System Master Plan was based on the U.S. Census, output from the Department of Water Resources population estimating tool for Urban Water Management Planning, and the MKN Technical Memorandum: City of Soledad Existing and Future Demand Analysis.

FIGURE 3-5: POPULATION LOGISTICS CURVE[2]

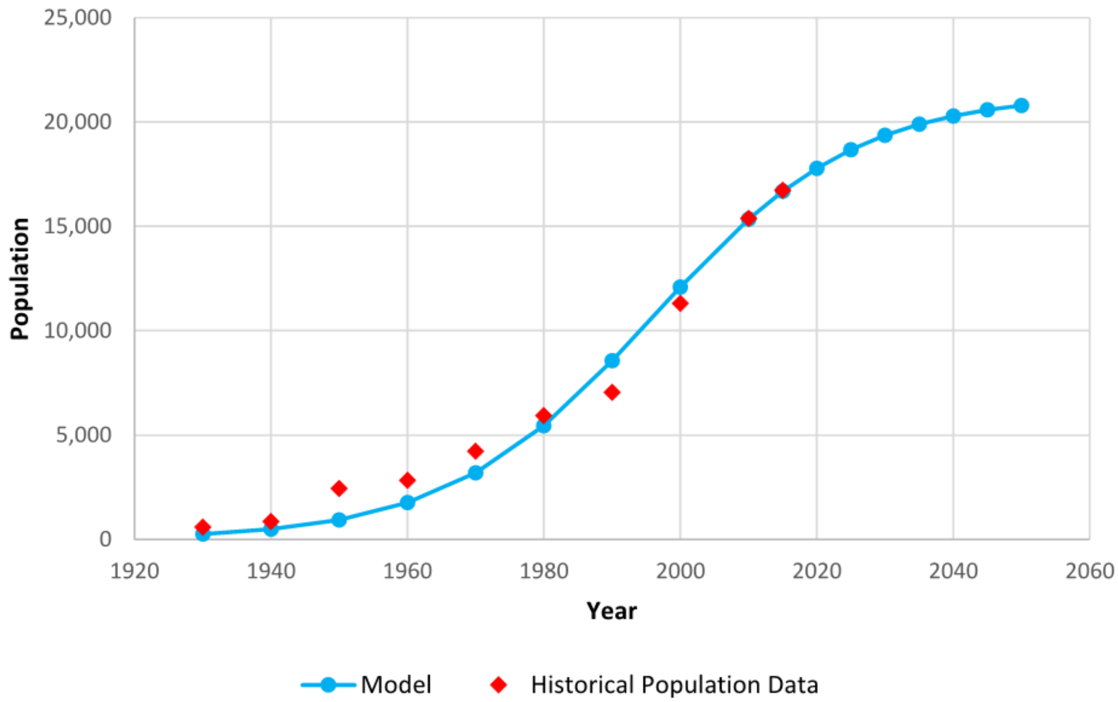


TABLE 3-1: POPULATION – CURRENT AND PROJECTED

	2020	2025	2030	2035	2040	2045
Population Estimates	17,789	20,388	20,746	23,531	26,308	31,865

3.4.2 OTHER SOCIAL, ECONOMIC, AND DEMOGRAPHIC FACTORS

Table 3-2 compares 2019 demographics for the City of Soledad, the County of Monterey, the State of California, and the United States. These statistics highlight the diversity of the community, with 61 percent of households reporting a language other than English spoken in the home. The median household income was 9.3 percent below the County average, while the median home value was 28 percent below the County average, making Soledad an attractive place for new homebuyers.

[2] City of Soledad Water System Master Plan Report, April 2019, prepared by Harris & Associates and NCS Engineers.

TABLE 3-2: SELECT DEMOGRAPHICS

	SOLEDAD	MONTEREY COUNTY	CALIFORNIA	U.S.
2019 Population (Includes Correctional Facilities)	25,999	434,061	39,512,223	328,239,523
Median Age	35.8	35.0	36.5	38.1
Median Household Income	$64,472	$71,015	$75,235	$65,712
Median Home Value, Owner-Occupied Units	$370,800	$516,000	$505,000	$240,500
Poverty Rate	13.5%	13.1%	11.8%	12.3%
High School Graduate or Higher (>=25 Years Old)	60%	72%	83%	88%
Language Other than English Spoken at Home	61%	55%	44%	22%
Source: 2019 American Community Survey 5-Year Estimates, Map Survey Program, https://data.census.gov/cedsci/.				

3.4.3 LAND USE

The City's 2005 General Plan[3] provides meaningful guidance to decision-makers related to land use planning and potential water demand. The General Plan lays out five areas for development, as shown in Table 3-3.

TABLE 3-3: GENERAL PLAN DEVELOPMENT POTENTIAL

DEVELOPMENT	SINGLE FAMILY (UNITS)	MEDIUM DENSITY (UNITS)	HIGH DENSITY (UNITS)	COMMERCIAL (SQFT)	INDUSTRIAL (SQFT)
Miravale II	602	92–158	120–185	50,000	0
North Entryway	115	23–40	43–66	1,219,680	0
San Vicente West	507	69–119	103–158	50,000	0
Mirassou	1,299	139–238	215–330	100,000	0
Northwest Expansion Area	3,600	1,400–2,400	325–500	1,135,000	8,500,000

As noted above, residential connections have increased approximately 2.6 percent from 2016 to 2020. The City has numerous completed and ongoing developments within its existing water service area. One major, nearly completed development includes Hartnell College Education Center (95 percent complete as of April 2021).

Current and future major developments are listed in Table 3-4. Estimates of the additional water demand created by these developments are included in the demand estimates of this UWMP.

[3] City of Soledad General Plan, September 21, 2005, prepared by Crawford, Multari & Clark Associates, https://cityofsoledad.com/business/general-plan/.

TABLE 3-4: STATUS OF PROPERTY DEVELOPMENT

Name	Location	Size	Type	Status
540 Gabilan	Gabilan	4.61 acres	96 Apartments	Permits Issued
Orchard Villas	West of Orchard Lane	29.4 acres	163 Units	Permits Issued to Phase 6
Las Viviendas	East of Jack Franscioni School	4.96 acres	92 Condominium Units	Grading Permits Issued
Santa Clara	North of Santa Clara Street	8.33 acres	102 Town Homes, 36 Apartments	In Plan Check
230 8th Street	Corner of Monterey and 8th	2.8 acres	42 Apartment Units	In Plan Check
1430 Monterey Street	Monterey Street	1 acre	20 Apartment Units	Plan Check Complete
Miravale Parcel H	SW Corner of Orchard and Gabilan	1 acre	20 Apartment Units	In Plan Check
Liberty Court	East of Granada Street	4 acres	27 Units	Planning Approval
Miravale Parcel B	Orchard Lane north of the new park	4.05 acres	Proposed 38 SFT lots pending planning approval	Planning Phase, Application Incomplete
Miramonte	Proposed annexation north of the City limits	Approximately 600 acres	2,392 units	Pending Annexation

The Mirassou Specific Plan area was envisioned as one of the City’s major future growth areas. Today, the Miramonte Specific Plan encompasses much of the area formerly covered by the Mirassou Specific Plan. The Miramonte Specific Plan includes an approximately 600-acre annexation area of vacant land located north of the existing city limits (Figure 3-6). The City plans to annex the land and add 2,392 units.

Camphora is an unincorporated community of Monterey County that lies between downtown Soledad and the correctional facilities. The City provides Camphora with wastewater collection but does not provide drinking water; Camphora is presently on well water. Camphora is within the city’s sphere of influence, and it is possible that the City could provide water to Camphora in the future. However, there is no Specific Plan for Camphora, and thus, it is not considered in this 2020 UWMP.

FIGURE 3-6: MIRAMONTE ANNEXATION AREA

Figure 1-2
Aerial Photograph
Miramonte Specific Plan - Plan for Services

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4 WATER USE CHARACTERIZATION

System water use addresses the City's water demand—past, current, and projected—identifying the level of treatment when delivered—potable and recycled.

This chapter provides a characterization and analysis of projected water use through the year 2045. Projections considered past and current water use, anticipated development of the vacant land in the city, new regulations, changing climate conditions, and trends in customer water behaviors. This analysis examined water use by sector and aggregated the information into a comprehensive demand projection of customer water use. In Chapter 7, these water demand projections are integrated with the City's water supplies to assess long-term water system reliability.

The City has chosen to provide projections through 2045, a 25-year planning period. This will improve the use of the UWMP for other land use planning and regulatory compliance issues by bridging the gap between planning cycles.

4.1 WATER USE BY TYPE – POTABLE 2020

The City's potable water consumption can be projected by understanding the type of use and customer type creating the demand. Developing local water use profiles helps to identify quantity of water used, and by whom, within the City's service area. A comprehensive profile of the City's service area enables the City to adequately plan for future demands and to assess trends in customer end uses that may result in changes in demographics, the economy, and weather and climate, as well as from active and passive water conservation efforts.

The City currently provides domestic water to residential, commercial, industrial and institutional, and landscape customers within the City's service area. In 2020, water demand for potable water totaled 2,264.26 AF, as summarized in Table 4-1.

TABLE 4-1: DEMANDS FOR POTABLE WATER – 2020 ACTUAL

USE TYPE	2020 ACTUAL		
	ADDITIONAL DESCRIPTION, AS NEEDED	LEVEL OF TREATMENT WHEN DELIVERED	VOLUME (AF)
Single Family	Residential	Drinking Water	1,333.98
Multi-Family	Residential	Drinking Water	275.82
Commercial		Drinking Water	125.54
Industrial		Drinking Water	3.78
Institutional/Governmental		Drinking Water	219.04
Landscape		Drinking Water	79.15
Other Potable	Hydrant	Drinking Water	24.52
Other Potable	Authorized Unbilled	Drinking Water	22.78
Losses		Drinking Water	179.65
		TOTAL	**2,264.26**

The City provided water service through 4,132 residential, commercial, industrial and institutional, and landscape metered service connections in FY 2020, as shown in Table 4-2.

TABLE 4-2: CUSTOMER SERVICE CONNECTIONS FOR POTABLE WATER

USE TYPE	2020		
	ADDITIONAL DESCRIPTION, AS NEEDED	LEVEL OF TREATMENT WHEN DELIVERED	NUMBER OF CONNECTIONS
Single Family	Residential	Drinking Water	3,438
Multi-Family	Residential	Drinking Water	440
Commercial		Drinking Water	153
Industrial		Drinking Water	3
Institutional/Governmental		Drinking Water	41
Landscape		Drinking Water	42
Other Potable	Hydrants	Drinking Water	15
		TOTAL	**4,132**

4.2 WATER USE BY SECTOR – PROJECTED

The following sections summarize the methodology used to calculate demand projections by water use sector.

Growth in water use was projected based on detailed growth in water service connections by use type. The growth in the number of connections was based on City planning estimates for new developments, which were discussed in Chapter 3. Appendix B contains the detailed estimates for growth in connections and water use.

Water use per connection was projected forward using data on historical usage per connection per day and assuming a conservation factor for future use, as follows:

- **Single-Family, Multi-Family, Institutional/Governmental:**
  Base rate = average gallons per day per connection for 2016–2020
  2022: Base rate less 1 percent conservation rate
  2023: Base rate less 1.5 percent conservation rate
  2024: Base rate less 2 percent conservation rate
  2025–2045: Base rate less 2.5 percent conservation rate
- **Commercial:**
  Base rate = 2020 gallons per connection. Use per connection decreased 3.4 percent per year from 2016 to 2020. Because it would be difficult to maintain this trend, assumed a reduced conservation rate, as follows:
  2022: Base rate less 2 percent conservation rate
  2023: Base rate less 3 percent conservation rate
  2024: Base rate less 4 percent conservation rate
  2025–2045: Base rate less 5 percent conservation rate

- **Industrial:** Industrial use varied greatly from year to year from 2016 to 2020. The average of the five-year period closely matched 2020. The average of 2016–2020 gallons per day per connection was held constant throughout the planning period.
- **Landscaping:** Non-potable water use (recycled) is projected to begin by 2022 at 50 percent of the treated wastewater flow, increasing to 80 percent by 2045. All recycled water will be used on City-owned properties, including parks and sports (baseball and soccer) fields. Recycled water is discussed further in Chapter 6 and reported in Table 6-4.
  Base rate = average gallons per day per connection for 2016–2020
  2022–2025: Base rate less 49 AFY
  2030: Base rate less 55 AFY
  2035: Base rate less 65 AFY
  2040: Base rate less 70 AFY
  2045: Base rate less 80 AFY
- **Water Loss:** The average water loss as a percent of metered demand for 2016–2020 was 8.11 percent. This rate was held constant throughout the planning period.
- **Authorized Unbilled Water Use:** The average unbilled water use as a percent of water produced was 1.83 percent for 2016–2020. This rate was held constant throughout the planning period.

Table 4-3 presents projected potable water demand by use type for the years 2025 through 2045. The significant jump in 2035–2045 reflects an assumption that the Miramonte development buildout occurs in this time frame.

TABLE 4-3: USE FOR POTABLE WATER – PROJECTED

USE TYPE	ADDITIONAL DESCRIPTION	PROJECTED WATER USE				
		2025	2030	2035	2040	2045
Single Family	Residential	1,285	1,291	1,425	1,558	1,825
Multi-Family	Residential	450	486	621	756	1,026
Commercial		120	120	122	123	127
Industrial		4	4	4	4	4
Institutional		197	197	203	208	213
Landscape		75	75	75	74	74
Other Potable	Hydrants	28	28	35	42	55
Other Potable	Authorized Unbilled	43	44	50	55	66
Losses		156	160	174	193	233
	TOTAL	**2,358**	**2,405**	**2,709**	**3,013**	**3,623**
Notes: Consistent with DWR Submittal Table 4-2.						

4.3 WATER USE BY WATER TYPE – PAST, CURRENT, AND PROJECTED

While not part of the DWR UWMP Reporting Tables, the Water Code requires retail suppliers to quantify past water use. Understanding past water use provides valuable information for development of projected uses as it helps to understand water use trends, effects of temporary use restrictions imposed during the most recent prolonged drought and recovery, effects of long-term demand management measures, and other pertinent water use factors.

Table 4-4 provides total water demand by water source type for each year from 2016 through 2020 actual use and for 2025 through 2045 projections.

TABLE 4-4: TOTAL GROSS WATER USE BY WATER TYPE – PAST, CURRENT, AND PROJECTED (AF)

PAST/CURRENT – YEARS	2016	2017	2018	2019	2020
Potable Water	1,931	2,085	2,073	2,124	2,264
Recycled Water Demand	0	0	0	0	0
TOTAL PAST/CURRENT WATER DEMAND	**1,931**	**2,085**	**2,073**	**2,124**	**2,264**
PROJECTED – YEARS	**2025**	**2030**	**2035**	**2040**	**2045**
Potable Water	2,358	2,405	2,709	3,013	3,623
Recycled Water Demand	49	55	65	70	80
TOTAL PROJECTED WATER DEMAND	**2,407**	**2,460**	**2,774**	**3,083**	**3,703**
Notes: Consistent with DWR Submittal Table 4-3.					

4.4 DISTRIBUTION SYSTEM WATER LOSSES

Urban water suppliers are required to quantify their distribution system water losses in a manner consistent with the American Water Works Association (AWWA) water system balance methodology for the most recent 12-month period available. Reporting of system losses was first required by the CWC in the 2015 UWMPs.

System water loss is the difference between water production and water consumption and represents “lost” water. AWWA categorizes distribution system losses as Apparent Losses and Real Losses, which are defined as follows:

- **Apparent Losses:** Unauthorized consumption, metering inaccuracies, and systematic data handling errors. Apparent Losses include all types of inaccuracies associated with customer metering (worn meters and improperly sized meters or wrong type of meter for the water usage profile) and systematic data handling errors (meter reading, billing, archiving, and reporting), plus unauthorized consumption (theft or illegal use).
- **Real Losses:** Physical water losses from the pressurized system (water mains and customer service connections) and storage tanks, up to the point of customer consumption (customer meter). The annual volume lost through all types of leaks, breaks, and overflows depends on frequencies, flow rates, and average duration of individual leaks, breaks, and overflows.

AWWA also defines Non-Revenue Water, which is the sum of Apparent Losses + Real Losses + Unbilled Metered Consumption + Unbilled Unmetered Consumption. This is water that does not provide revenue potential to the City. Unbilled Consumption is not included in the volume of water loss in Table 4-5 because it is authorized. Unbilled Consumption is defined as follows:

- **Unbilled Authorized Consumption:** All consumption that is unbilled but still authorized by the City. Includes both unbilled metered and unmetered consumption typically in non-account uses, including water for firefighting and training, flushing of water mains and sewers, street cleaning, watering of municipal gardens, public fountains, or similar public-minded uses. Occasionally, these uses may be metered and billed (or charged a flat fee), but usually, they are unmetered and unbilled.

The City has prepared the required AWWA Water Audit Software (WAS) v6.0 (Appendix C) water loss audit worksheets based on the best available information and in accordance with the DWR guidelines for each of the prior five years. The calculated water losses (water supplied less authorized consumption) identified using the AWWA Water Audit are shown in Table 4-5.

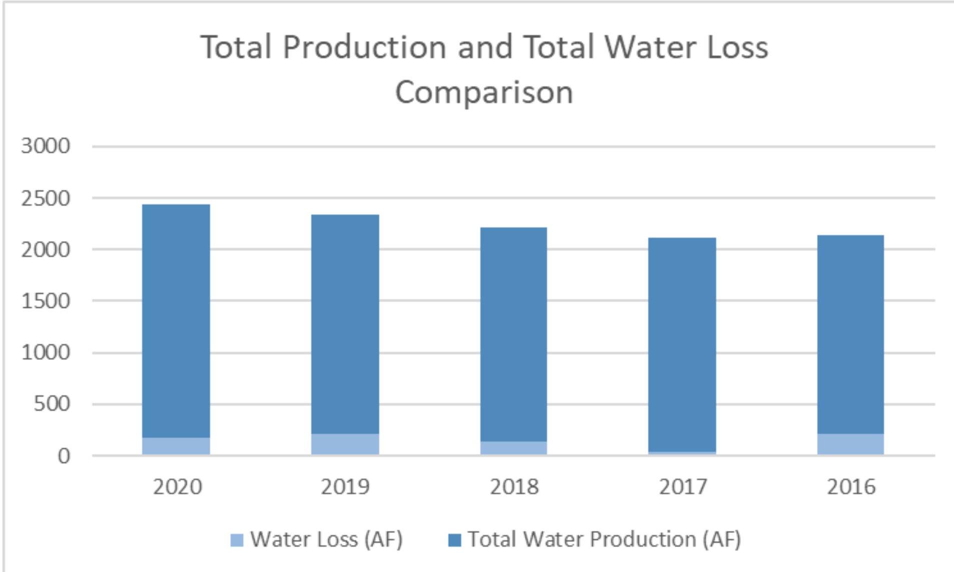
TABLE 4-5: LAST FIVE YEARS' WATER LOSS AUDIT REPORTING

REPORTING PERIOD START DATE (MONTH/YEAR)	VOLUME OF WATER LOSS (AF)*	TOTAL WATER PRODUCTION FOR COMPARISON (AF)
01/2020	179.65	2,264
01/2019	209.63	2,124
01/2018	136.11	2,073
01/2017	33.97	2,085
01/2016	211.96	1,931
Notes: Consistent with DWR Submittal Table 4-4. * Source: FY 2016–FY 2020 AWWA Water Audits; from the field "Water Losses" (combined Apparent and Real Losses).		

The volume of water loss calculated for FY 2020 represents 7.93 percent of the City's annual water production. Although percentage indicators—typically, the ratio of authorized customer consumption to distribution system input—may be used, AWWA discourages use of percentage indicators. Using percentage indicators to assess water loss in distribution systems gives a misleading and unreliable measure of utility performance because a percentage indicator is greatly affected by changing levels of customer consumption, it is difficult to distinguish among the specific components of Non-Revenue Water occurring in a distribution system, and the percentage reveals nothing about water volumes and associated costs (the two most important factors in assessing water waste within a distribution system). Rather, the industry best practice for water loss auditing, created by the International Water Association (IWA) and AWWA, now quantifies several key performance indicators that provide a vastly superior means for assessing water loss performance in distribution systems while recognizing that contributing factors and potential corrective measures are specific to each water utility.

Figure 4-1 shows a comparison of total water loss to total water production for the past five years.

FIGURE 4-1: TOTAL WATER LOSS COMPARED TO TOTAL WATER PRODUCTION FOR 2016 THROUGH 2020



Given the acceptable volume of losses based on AWWA standards, the City will focus its water loss control program to run an efficient water system. Understanding and controlling water loss from a distribution system is an effective way for the City to achieve regulatory standards and manage its existing resources.

4.5 CHARACTERISTIC FIVE-YEAR WATER USE

New for the 2020 UWMP, CWC Section 10635(b) requires every urban water supplier to include a drought risk assessment for its water service as part of information considered in developing the demand management measures and water supply projects and programs to be included in the UWMP. The drought risk assessment is discussed in Chapter 7, Water Service Reliability and Drought Risk Assessment.

The first step is to estimate a realistic representation of expected water use that would be anticipated for the next five years, absent drought conditions or any prescribed actions taken per the WSC Plan (Chapter 8)—also known as "unconstrained demand." In other words, unconstrained demand is water demand absent any water supply restrictions. The more realistic these numbers are, the better prepared the City will be in the event of a long-term drought. These demand numbers can then be adjusted to estimate the five years' cumulative drought effects in the drought risk assessment.

The City is already implementing actions to reduce water use. Therefore, the City has chosen to consider that normal, unconstrained water use includes those actions.

Table 4-6 identifies if water savings are included in water uses projections for the years 2021 through 2025.

TABLE 4-6: INCLUSION IN WATER USE PROJECTIONS

Are future water savings included in projections?	Yes
If yes, indicate section or page number where citations of the codes, ordinances, etc., utilized in demand projections are located.	Section 4.8, Chapter 8, and Appendix D
Are lower income residential demands included in projections?	Yes
Notes: Consistent with DWR Submittal Table 4-5.	

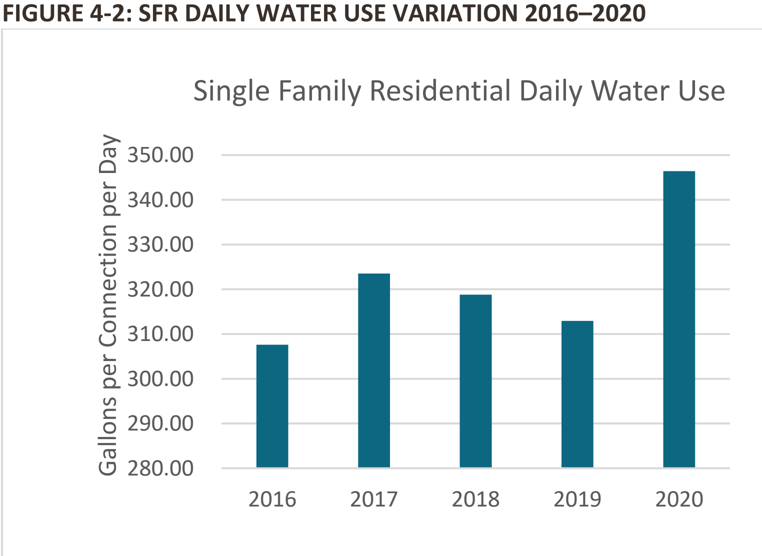
Estimates of characteristic, expected water use that would be anticipated for the next five years, based on unconstrained demand, are shown in Table 4-7. The amounts include water loss and authorized unbilled consumption.

TABLE 4-7: CHARACTERISTIC FIVE-YEAR WATER USE

WATER TYPE	CURRENT	PROJECTED (AF)				
	2020	2021	2022	2023	2024	2025
Potable Water	2,264	2,124	2,187	2,284	2,341	2,360
Recycled Water	0	0	49	49	49	49

Table 4-7 shows potable water use declines in 2021 over 2020. Single Family Residential (SFR) makes up the greatest proportion of water use in the City's service area, which can vary considerably from year to year. In 2020, SFR water use (per connection per day) was higher than the prior five years, as shown in Figure 4-2. This could reasonably be a result of the 2020 pandemic impacts and most people staying home during that year. As noted in Section 4.2 above, 2021 water use projections are based on average water use per connection for 2016–2020, or 321.9 gallons per connection per day.

FIGURE 4-2: SFR DAILY WATER USE VARIATION 2016–2020



4.6 WATER USE FOR LOWER INCOME HOUSEHOLDS

Since 2010, the Urban Water Management Planning Act has required retail water suppliers to include water use projections for single-family and multi-family residential housing needed for lower income households. This will assist the City in complying with the requirement under Government Code Section 65589.7, granting priority for providing water service to affordable households.[1]

"Lower income households" mean people and families whose income does not exceed the qualifying limits for lower income families. Generally, the state has established income limits for lower income households for all geographic areas of the state at 80 percent of area median income or median household income (MHI), adjusted for family size and revised annually. The MHI is based on the mean income of Monterey County with a 150 percent social equity adjustment applied.

DWR recommends that retail water suppliers rely on the housing elements of applicable land use agency's General Plans or other planning documents to quantify planned affordable housing for lower income households within the supplier's service area (DWR, 2020 UWMP Guidebook, Section 4.4, March 2021).

Low-income households are those that make less than 80 percent of the median income. The 2019 MHI in Monterey County was $70,681, while the City of Soledad was $70,372—the MHI for the City and the County are essentially the same. As such, Soledad households making less than $56,298 per year are considered lower income.

The City's 2015–2023 Housing Element (December 2018)[2] utilized the Regional Housing Needs Allocation (RHNA),[3] which is a projection of housing need for households by income level. The RHNA identified that Soledad's low-income housing need is an additional 30 units, very-low income housing need is an additional 23 units, and extremely low income housing need is an additional 23 units.

Water demands were estimated using the average number of persons per household (2.95) multiplied by the gallons per capita per day (GPCD) of 117, which is the target GPCD shown in Chapter 5. Total estimated water use for low-income housing units is shown in Table 4-8, which was included in the City's total projected water demands.

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[1] Each public agency or private entity providing water or sewer services shall grant a priority for the provision of these services to proposed developments that include housing units affordable to lower income households. Law Section (ca.gov) (CA Government Code Section 65589.7).

[2] https://cityofsoledad.com/business/general-plan/.

[3] https://ambag.org/sites/default/files/2019-12/RHNP%202014-2023_Final_revised_PDFA_2.pdf.

TABLE 4-8: CITY OF SOLEDAD LOW-INCOME WATER DEMANDS

HOUSING UNITS/WATER DEMAND	HOUSING NEED	WATER DEMAND (AFY)
Extremely Low	23	3.01
Very Low	23	3.01
Low	30	3.93
TOTALS	**76**	**9.95**
Source: City of Soledad Housing Element (December 2018) and Regional Housing Needs Allocation, Association of Monterey Bay Area Governments.		

4.7 CLIMATE CHANGE IMPACTS CONSIDERED IN WATER USE PROJECTIONS

Climate change adds a level of uncertainty to the challenges of water planning—both for water supply and water use. The City's water use demand projections are the summation of its residential water demand; commercial, industrial, and institutional (CII) demand; large landscape demand; potential future recycled water demands; and water losses. The City has considered the following climate change impacts in these water use projections for the 25-year planning period and in its future water supply projects presented in Chapter 6.

California. California's water supply planning has nearly 100 years of hydrological data regarding weather and water supply. The history of rainfall data has provided a sound foundation for forecasting both the frequency and the severity of future drought conditions and the frequency and abundance of above-normal rainfall. However, changing climate patterns are expected to shift precipitation patterns and affect water supply, resulting in the need to change water use behavior. Unpredictable weather patterns will make water supply planning more challenging and increase the need for water use efficiency measures.

According to the California Climate Adaptation Planning Guidance (June 2020),[4] climate change is already impacting California and will continue to affect it for the foreseeable future. Current and projected climate changes include increased temperatures; sea-level rise; a reduced winter snowpack resulting in less runoff to fill reservoirs, lakes, and streams; altered precipitation patterns; increases in wildfires; and more frequent storm events. Over the long term, reducing greenhouse gas (GHG) emissions can help make climate change less severe.

Climate change causes the weather to become more variable, with longer and more frequent droughts and increased periods of heavy rain and snow events. This results in an intensification of impacts on all water-related or dependent activities and systems. With higher temperatures, people and plants dry out faster, resulting in higher water demand from both households and agriculture. Higher temperatures also change the rate of chemical reactions in water and reduce water's ability to hold oxygen. These factors reduce the viability of water to support wildlife and ecosystems.

Given increased temperatures and evapotranspiration, it is expected that landscape irrigation use may tend to increase. However, this is countered by the statewide mandate to reduce per-

[4] California Adaptation Planning Guide or https://www.caloes.ca.gov/HazardMitigationSite/Documents/CA-Adaptation-Planning-Guide-FINAL-June-2020-Accessible.pdf.

capita use and limit outdoor per-capita use in the coming years. These mandates will likely override any climate-related changes quantified.

Regional. A regional study was completed by the U.S. Geological Survey (Flint and Flint 2012)[5] on how changing climate variables lead to a change in potential evapotranspiration, recharge, runoff, and climatic water deficit within the Santa Cruz Mountains. Numerous other regional studies on climate change have also been prepared and conveniently summarized in the Greater Monterey County Integrated Regional Water Management (IRWM) Plan. The IRWM Plan utilized these studies to prepare a vulnerability assessment to gauge the level of risk from each potential climate change impact in the region. High risk equals high priority, including rainfall reduction, more frequent droughts, and higher groundwater extraction, all of which were considered in the City's water use projections for this UWMP.

4.8 CONSERVATION EFFECTS ON WATER USAGE

Water conservation/water use efficiency is a key strategy for meeting future demand, especially amidst the prolonged drought conditions in California. Efficient water use is the most cost-effective way to achieve long-term conservation goals and to provide the water supply reliability needed to adapt to the longer and more intense droughts that climate change is causing in California. The State Water Resources Control Board (SWRCB) stated in Resolution 2017-004, "Water conservation is the easiest, most efficient and most cost-effective way to quickly reduce water demand and extend supplies, providing flexibility for all California communities. Water can be conserved even when it's raining, especially by turning off outdoor irrigation when the weather is providing ample irrigation."

The City's Mandatory Water Conservation Regulations (Chapter 13.09 of City of Soledad Municipal Code, Ordinance 534, 1993) (Appendix D) provides a foundation of permanent water conservation best management practices to be implemented by water consumers at all times. These regulations also include operational best practices utilized by the City.

DWR and the SWRCB have placed emphasis on achieving improvements for long-term reliability and resilience to drought and climate change in California.

Water Conservation Act of 2009. The Water Conservation Act of 2009, or SBX7-7, provides the regulatory framework to support the statewide reduction of 20 percent urban per capita water use by the year 2020 (20x2020). Each retail water supplier was to determine and report its existing baseline water consumption and to establish an interim target (2015) and a final 2020 target in their 2010 UWMP. In 2015, each retail water supplier was required to identify the status of its 2015 interim target and reaffirm its 2020 target. In this 2020 UWMP, each retail water supplier is to confirm that it met its 2020 target (Chapter 5).

The Water Awareness Committee of Monterey County implements conservation programs and policies in partnership with and/or on behalf of its member agencies, including the City.

[5] https://pubs.usgs.gov/sir/2012/5132/pdf/sir20125132.pdf.

Implementation of conservation programs and policies helps with both compliance with SBX7-7 and meeting long-term water supply reliability goals. The City's 20x2020 baselines and targets are discussed in Chapter 5.

Making Conservation a Way of Life. In April 2017, five state agencies (SWRCB, DWR, Energy Commission, Public Utilities Commission, and Department of Food and Agriculture) published a framework document that was used to formulate the water conservation legislation. Legislation related to water supply planning in California has evolved to address these issues, namely Making Conservation a Way of Life (Assembly Bill (AB) 1668 and Senate Bill (SB) 606) and Water Loss Performance Standards (SB 555).

AB 1668 and SB 606 collectively build on ongoing efforts to make water conservation a way of life in California and to create a new foundation for long-term improvements in water conservation and drought planning. The bills establish guidelines for efficient water use and a framework for the implementation and oversight of the new standards. The two bills strengthen the state's water resiliency in the face of future droughts with provisions that include the following:

- Establishing water use objectives and long-term standards by November 1, 2023, and every November thereafter for efficient water use that applies to urban retail water suppliers; such objectives to be comprised of indoor residential water use, outdoor residential water use, CII irrigation with dedicated meters, water loss, and other unique local uses. These water use objectives will further conserve water and increase reliability.
- Providing incentives for water suppliers to recycle water.
- Identifying small water suppliers and rural communities that may be at risk of drought and water shortage vulnerability and providing recommendations for drought planning.
- Requiring both urban and agricultural water suppliers to set annual water budgets and prepare for drought.

SB 555 (2015, Water Code Section 10608.34, subdivision (i)) directs the SWRCB to "adopt rules requiring urban retail water suppliers to meet performance standards for the volume of water losses." Pursuant to this law, urban retail water suppliers are required to submit water loss audit reports to DWR annually since October 2017.

The City's water use efficiency and conservation efforts are making a positive impact on customer water use. Also known as "demand management," water use efficiency and conservation are an integral part of sustainably managing water resources in California. A growing population can increase the demand for water. Without mitigation measures, increased water demand, coupled with reduced supplies or shifts in supplies related to climate change and other factors, can jeopardize water reliability. Chapter 9 presents the demand management measures the City is implementing to reduce demand, improve water service reliability, help meet state and regional water conservation goals, and reduce energy costs. Chapter 9 also explains the upcoming water use objectives.

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5 SBX7-7 BASELINES AND TARGETS

The California Water Conservation Act of 2009, also known as SBX7-7 (Chaptered February 3, 2010), required water agencies to reduce per-capita water use by 20 percent by the year 2020 (also known as 20x2020). Chapter 5 demonstrates that the City has complied with the requirements of SBX7-7.

5.1 ESTABLISHING BASELINES AND TARGETS

The City is required to be in compliance with SBX7-7 either individually or as part of an alliance, or demonstrate it has a plan or has secured funding to be in compliance, in order to be eligible for water-related state grants and loans.

To comply with SBX7-7, the City established a baseline water usage in its 2010 UWMP, which was then used to set targets for 2015 (interim target) and 2020 (target). SBX7-7 legislation stipulates that targets were to be established by using one of four allowable methods.

In 2010 and in 2015, the City calculated its 2020 urban water use target by using Method 3, which assigns a static 2020 urban water use target based on a water supplier's location within one of the 10 hydrological regions' urban water use target areas. The allowable methods are briefly defined as follows:

- **Method 1:** Per-capita daily use equals 80 percent of the water supplier's baseline per-capita usage.
- **Method 2:** Per-capita daily use is set based on performance standards applied to indoor residential use, landscape area water use, and commercial, industrial, and institutional use.
- **Method 3:** Per-capita daily use is set at 95 percent of the applicable state hydrologic region target based on DWR's 2011 20x2020 Water Conservation Plan (Soledad is in the Central Coast Region).
- **Method 4:** Per-capita daily use is set based on standards consistent with California Urban Water Conservation Council (CUWCC)[1] BMPs.

Beginning in 2010, the City was required to develop a baseline per-capita water use (gallons per capita per day [GPCD]) and set a per-capita water use interim target for 2015 and a 2020 target that represented the required 20 percent reduction in water use. The City established baseline water use for two baseline periods, the 10- to 15-year baseline (baseline GPCD) and the 5-year baseline (target confirmation). In the 2015 UWMP, the City determined baseline water use during a baseline period and identified water use targets for the years 2015 and 2020 to meet the state's

[1] The CUWCC is now the California Water Efficiency Partnership (CalWEP). With increased pressure from a changing climate – more severe droughts and water uncertainty – and new mandatory regulations from the State of California, including the new framework to "Make Water Conservation a California Way of Life," the CUWCC membership voted to allow the organization to sunset after 25 years, replacing it CalWEP in March 2018.

water reduction goal. Baseline water use was calculated as a continuous 10-year average during a period, which ended no earlier than December 31, 2004, and no later than December 31, 2010.

Using Method 3, the City's 2020 urban water use target is documented as 117 GPCD. The City of Soledad is in the Central Coast Region, which has a 2020 regional target of 123 GPCD. The 117 GPCD target is 95 percent of the regional target. This GPCD target is intended to be maintained through the UWMP planning horizon of 2045.

For the 2015 UWMP, the City had the opportunity to adjust the baseline and target per-capita water use and compare 2015 per-capita water use with set targets. The City did not revise its baseline per-capita water use calculations. In the 2015 UWMP, the City demonstrated compliance with its 2015 interim target of 135 GPCD, with an actual interim target of 107 GPCD.

Table 51 presents the baseline periods: the City's 15-year (1998 through 2007) and five-year (2003 through 2007) periods, the average baseline GPCD for each, and the confirmed 2020 target of 117 GPCD.

TABLE 5-1: BASELINES AND TARGETS SUMMARY (GPCD)

BASELINE PERIOD	START YEAR	END YEAR	AVERAGE BASELINE*	CONFIRMED 2020 TARGET*
10–15 Years	1998	2007	154	117
5 Years	2003	2007	169	
* All values are in gallons per capita per day (GPCD).				
Notes: Data from 2015 UWMP SBX7-7 Verification Forms, previously submitted to and approved by DWR.				

For this 2020 UWMP, the City must demonstrate compliance with meeting its 2020 water use target.

5.2 NO CHANGE IN CALCULATIONS FROM 2015 UWMP

In the 2015 UWMP, CWC Section 10608.20 provided that an urban retail water supplier may choose to update its 2020 urban water use target, including changing the methodology. The City chose to continue with Method 3, although the targets were updated based on revised population data. DWR requires water suppliers to use the 2010 U.S. Census data for its baseline population calculations, and the full census data was not available until 2012. The target method may not be changed in any amendments to the 2015 UWMP or in the 2020 UWMP. For the 2020 UWMP, the City has not updated calculations for the water use targets.

5.3 SERVICE AREA POPULATION

To calculate annual GPCD, the City must correctly determine the population it served for each baseline year in both of the baseline periods, for the 2015 interim compliance year, and for the 2020 compliance year. As discussed above, the 2015 UWMP updated its baseline population, which adjusted the interim and target GPCD values originally calculated in the 2010 UWMP.

The 2020 population in the City's water service area is 17,789, as shown in Chapter 3, Section 3.4.1.

5.4 GROSS WATER USE

To calculate the 2020 GPCD, gross water use must be used. As defined in CWC Section 10608.12, "Gross Water Use" means the total volume of water, whether treated or untreated, entering the distribution systems of an urban retail water supplier, excluding all of the following: (1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier; (2) The net volume of water that the urban retail water supplier places into long-term storage; (3) The volume of water the urban retail water supplier conveys for use by another urban water supplier; and (4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24. Additionally, "an urban retail water supplier that has a substantial percentage of industrial water use in its service area is eligible to exclude the process water use of existing industrial water customers from the calculation of its gross water use to avoid a disproportionate burden on another customer sector."

The City does not currently deliver recycled water within its service area, does not export domestic water to another urban retail supplier, does not deliver water for agricultural use, and does not have a substantial percentage of industrial water use. Therefore, there are no exceptions to be taken into consideration when calculating the City's gross water use. The City's total allowable gross water use for 2020 GPCD compliance is 2,264 AF.

5.5 2020 COMPLIANCE GPCD

Under SBX7-7, individual agency targets must be established to meet the goal of a statewide 20 percent reduction in per-capita use by 2020.

Three allowable adjustments can be made to a supplier's 2020 actual water use calculations in the 2020 UWMP. Suppliers must provide adequate documentation of their calculations and data to support any changes in baselines, targets, or adjustments to water use. These adjustments include the following: (1) Extraordinary institutional water use for one-time events, such as fire suppression, that substantially increased the compliance year institutional water use; (2) Economic adjustment that captures substantial changes to institutional water use from new or expanded operations, or substantial changes to commercial or industrial water use resulting from increased business output and economic development; and (3) Weather normalization during the compliance year that accounts for differences in evapotranspiration and rainfall in the baseline and compliance reporting periods by removing the effects of weather on water consumption. The City did not have any adjustments for the 2020 compliance year.

In conformance with SBX7-7, the City surpassed the 2015 interim target and the 2020 target by achieving 107 GPCD in 2015 and 114 GPCD in 2020. The 2020 GPCD is an approximately 26 percent reduction from the baseline (154 GPCD) established in 2010.

There are many factors that contribute to the significant reduction in the City's per-capita water use during this time period, including active conservation from City-initiated activities, passive conservation attributable to plumbing efficiency gains, and outside influences, such as rainfall, or lack thereof. Annual variability in water use correlates with rainfall; per-capita water use follows these annual patterns of rainfall. Droughts, both natural and regulatory, have had a significant effect on the City's per-capita water use. The City's per-capita water use reduction is directly tied to the state's drought declaration in 2014 and subsequent calls for mandatory conservation.

Table 5-2 compares the City's 2020 target GPCD to its actual 2020 GPCD consumption. Based on this comparison, the City is in compliance with its 2020 target.

TABLE 5-2: 2020 COMPLIANCE

2020 GPCD			2020 CONFIRMED TARGET GPCD	DID SUPPLIER ACHIEVE TARGETED REDUCTION FOR 2020? Y/N
ACTUAL2020 GPCD	2020 TOTAL ADJUSTMENTS	ADJUSTED 2020 GPCD*		
114	0	114	117	Yes
*All values are in gallons per capita per day (GPCD).				

Included in Appendix E is a copy of the SBX7-7 Compliance Form, a set of standardized tables2 to demonstrate compliance with the Water Conservation Act. These tables have been submitted electronically as an Excel file to DWR upon adoption of this 2020 UWMP.

5.6 REGIONAL ALLIANCE

Water Code Section 10608.20 allows urban retail water suppliers to comply with SBX7-7 on an individual or regional basis. Water Code Section 10608.28 defines regional options by mutual agreement, referred to as a Regional Alliance. A Regional Alliance allows water suppliers to work toward cooperatively developing programs and meeting regional water conservation targets, but not necessarily submitting a Regional Plan. The City is not part of a Regional Alliance and is not reporting any compliance information in a Regional Alliance Report.

[2] Table numbers in Appendix E are not in numerical order. Some tables were not required to be completed and, therefore, are not included in the appendix, although the entire Excel file has been submitted to the state.

6 WATER SUPPLY CHARACTERIZATION

The Urban Water Management Planning Act requires a description and quantification of the current and projected sources of water available to the City. The Urban Water Management Planning Act also requires a discussion of potential uses and availability of the recycled water.

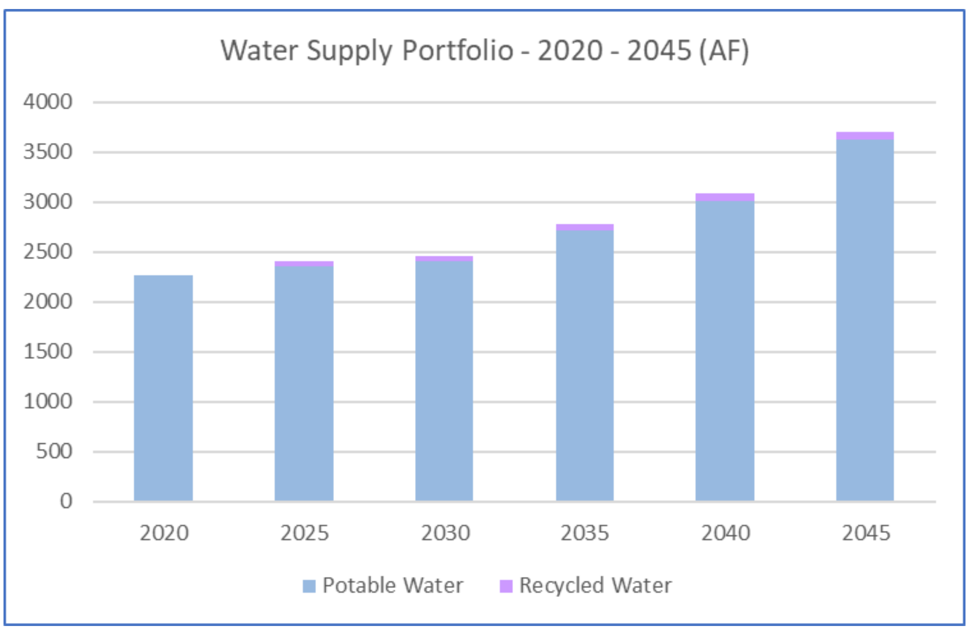
Chapter 6 provides an overview of the City's water sources, current and projected supply, wastewater services and available recycled water, other water source opportunities, future water supply projects, climate change impacts on water supply, and a review of energy intensity of City water facilities.

6.1 WATER SOURCES

The City's main source of water supply is groundwater from the Forebay Subarea of the Forebay Aquifer Subbasin, a subbasin of the Salinas Valley Groundwater Basin.

Through 2020, the City's total water supply to meet demands has been 100 percent groundwater. The City's water supply portfolio is projected to incorporate the use of 49 AF of recycled water by 2025, increasing to 80 AF by 2045, for non-potable irrigation uses. These amounts represent 2.0 percent and 2.2 percent, respectively, of total projected water demand. The balance of the projected demand in all years is for drinking water, supplied by local groundwater, as shown in Figure 6-1.

FIGURE 6-1: WATER SUPPLY PORTFOLIO – 2020–2045



6.2 WATER SUPPLY

6.2.1 PURCHASED OR IMPORTED WATER

The City currently uses local groundwater as the sole source of water supply and does not purchase or import water from any other water suppliers or entities.

6.2.2 GROUNDWATER

For planning purposes, the State of California has been divided into 10 separate hydrologic regions by DWR, based on the state's major drainage basins. According to the California Water Plan Update 2018 (DWR, June 2019),[1] the City is located in the Central Coast Hydrologic Region. The Central Coast Hydrologic Region is the most groundwater-dependent hydrologic region in California, with approximately 80 percent of agricultural, municipal, and domestic water demands met by the extraction of groundwater.[2] Imported surface water allocations from the State Water Project (SWP) and the Central Valley Project total up to 106,000 AF per year; however, actual volumes of imported water received vary annually. Major water-related challenges for the region include groundwater and surface water quality degradation, groundwater basin overdraft, flood risk, seawater intrusion, and aging infrastructure. Urban, environmental, and disadvantaged community (DAC) interests in the Central Coast are currently well-represented in the region's integrated regional water management (IRWM) efforts, which include new and updated IRWM plans and numerous implementation projects.

Each hydrologic region is divided into distinct groundwater basins, each of which is typically divided further into smaller interconnected groundwater subbasins. As part of the California Statewide Groundwater Elevation Monitoring (CASGEM) program, California Water Code Section 10920 requires DWR to prioritize groundwater basins to help identify, evaluate, and determine the need for additional groundwater level monitoring. DWR considers available data that includes the population overlying the basin; the total number of wells that draw from the basin; the irrigated acreage overlying the basin; the degree to which persons overlying the basin rely on groundwater as their primary source of water; any documentation impacts on the groundwater within the basin, including overdraft, saline intrusion, and other water quality degradation; and any other information determined to be relevant by the DWR.

Using groundwater reliance as the leading indicator of basin priority, DWR evaluated California's 515 alluvial groundwater basins and categorized them into five groups—very high, high, medium, low, and very low. The Forebay Aquifer, the subbasin underlying the City as summarized in the following section, is categorized as a "medium" priority basin.

6.2.2.1 BASIN DESCRIPTION

The Forebay Aquifer Subbasin (Basin Number 3-4.04) is one of nine subbasins of the Salinas Valley Groundwater Basin (Figures 6-2 and 6-3). The City is located above the Forebay Subarea of the

1 https://water.ca.gov/Programs/California-Water-Plan.

2 https://cawaterlibrary.net/document/california-water-plan-central-coast-hydrologic-region-report/.

Forebay Aquifer Subbasin.[3] Following the Salinas River through most of Monterey County, the Salinas Valley Groundwater Basin varies in width between three and 10 miles. The Forebay Subarea extends from approximately three miles south of the City of Gonzales, north to the City of Greenfield. Its northern border is shared with the "180/400-Foot" and Eastside Subbasins, while its southern boundary is shared with the Upper Valley Subbasin. The Forebay Aquifer Subbasin has a total surface area of 94,000 acres and provides the City with water from a confined deep aquifer zone.

The Salinas Valley Groundwater Basin receives its principal source of groundwater from the Salinas River, as the river and its tributaries percolate through alluvial materials and other porous geological structures. The Basin has experienced saltwater intrusion, due to overdraft, in the areas closer to the coast but does not affect the Forebay Subarea. The City is not directly affected by seawater intrusion, an issue managed by the Monterey County Water Resources Agency (MCWRA). There are currently no conjunctive use programs in the Forebay Aquifer Subbasin.

In 2015, agricultural pumping accounted for 93 percent of total groundwater pumping and urban uses accounted for the remaining seven percent of the reported extractions in the Salinas Valley Groundwater Basin. The Forebay Subbasin, specifically, showed agricultural pumping accounted for approximately 96 percent and urban uses for four percent of extractions.[4]

6.2.2.2 GROUNDWATER MANAGEMENT

Monterey County Groundwater Management Plan. MCWRA prepared a Groundwater Management Plan (GMP) report published in May 2006 (Appendix F), compliant with AB 3030 and SB 1938 legislation. The 2006 GMP provides a comprehensive overview of the Salinas Valley Groundwater Basin and recommends various management strategies for the basin. The plan specifies three Basin Management Objectives, which summarize the overall management objectives for the Salinas Valley Groundwater Basin and include the following:

- **Objective 1:** Development of Integrated Water Supplies to Meet Existing and Projected Water Requirements
- **Objective 2:** Determination of Sustainable Yield and Avoidance of Overdraft
- **Objective 3:** Preservation of Groundwater Quality for Beneficial Use

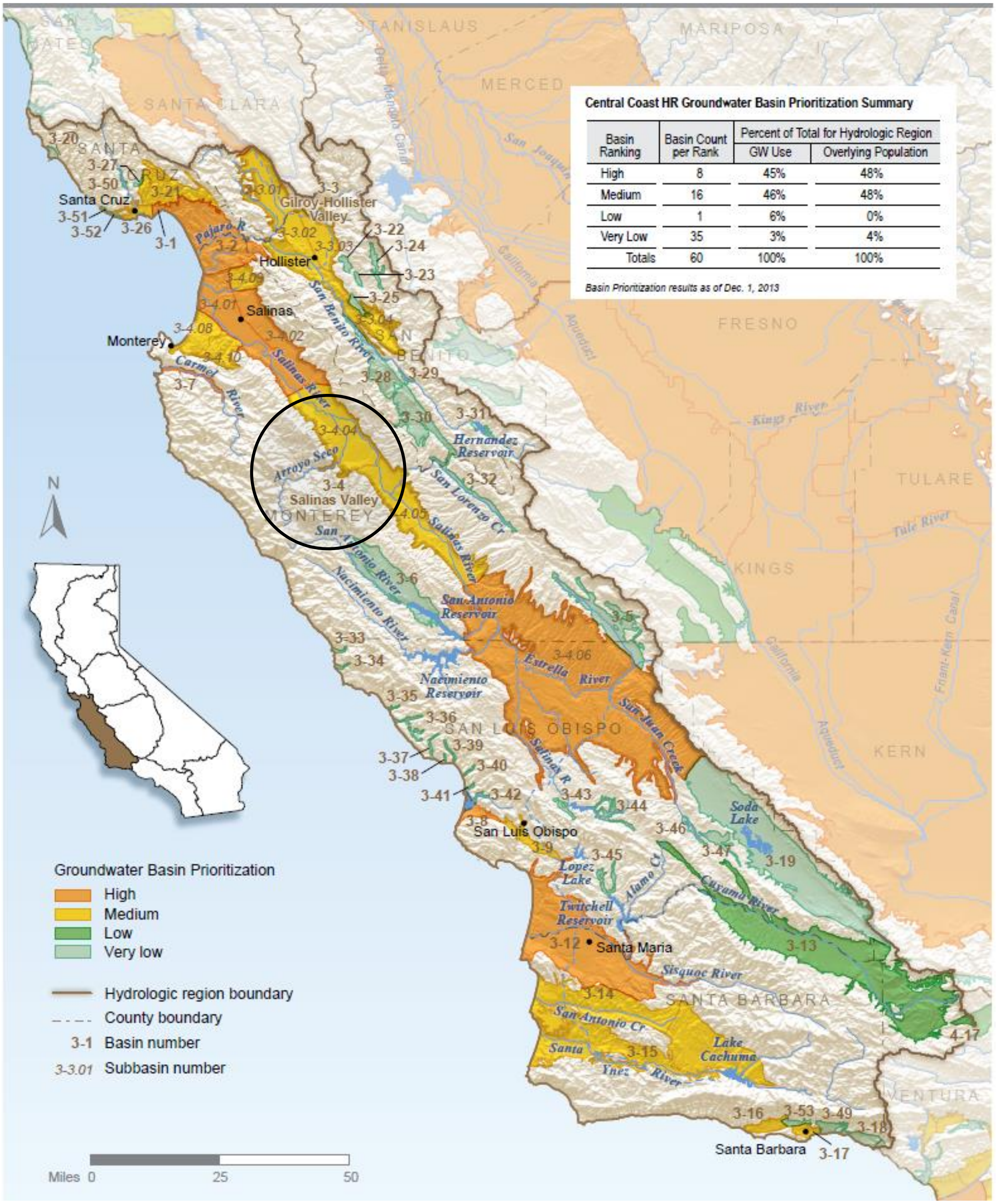
To meet the objectives, the GMP identified 14 elements that should be implemented by MCWRA:

- **Plan Element 1:** Monitoring of Groundwater Levels, Quality, Production, and Subsidence
- **Plan Element 2:** Monitoring of Surface Water Storage, Flow, and Quality
- **Plan Element 3:** Determination of Basin Yield and Avoidance of Overdraft
- **Plan Element 4:** Development of Regular and Dry Year Water Supply
- **Plan Element 5:** Continuation of Conjunctive Use Operations

[3] The Forebay Subbasin also has the Arroyo Seco Subarea, which receives a separate source of recharge due to the differences in geology. (Forebay Aquifer Subbasin GSP, 2020, Chapter 4).

[4] 2015 MCWRA Ground Water Extraction Data Summary Report, with 98 percent reporting of 1,901 wells. (Greater Monterey County IRWM Plan, Section B, 2018).

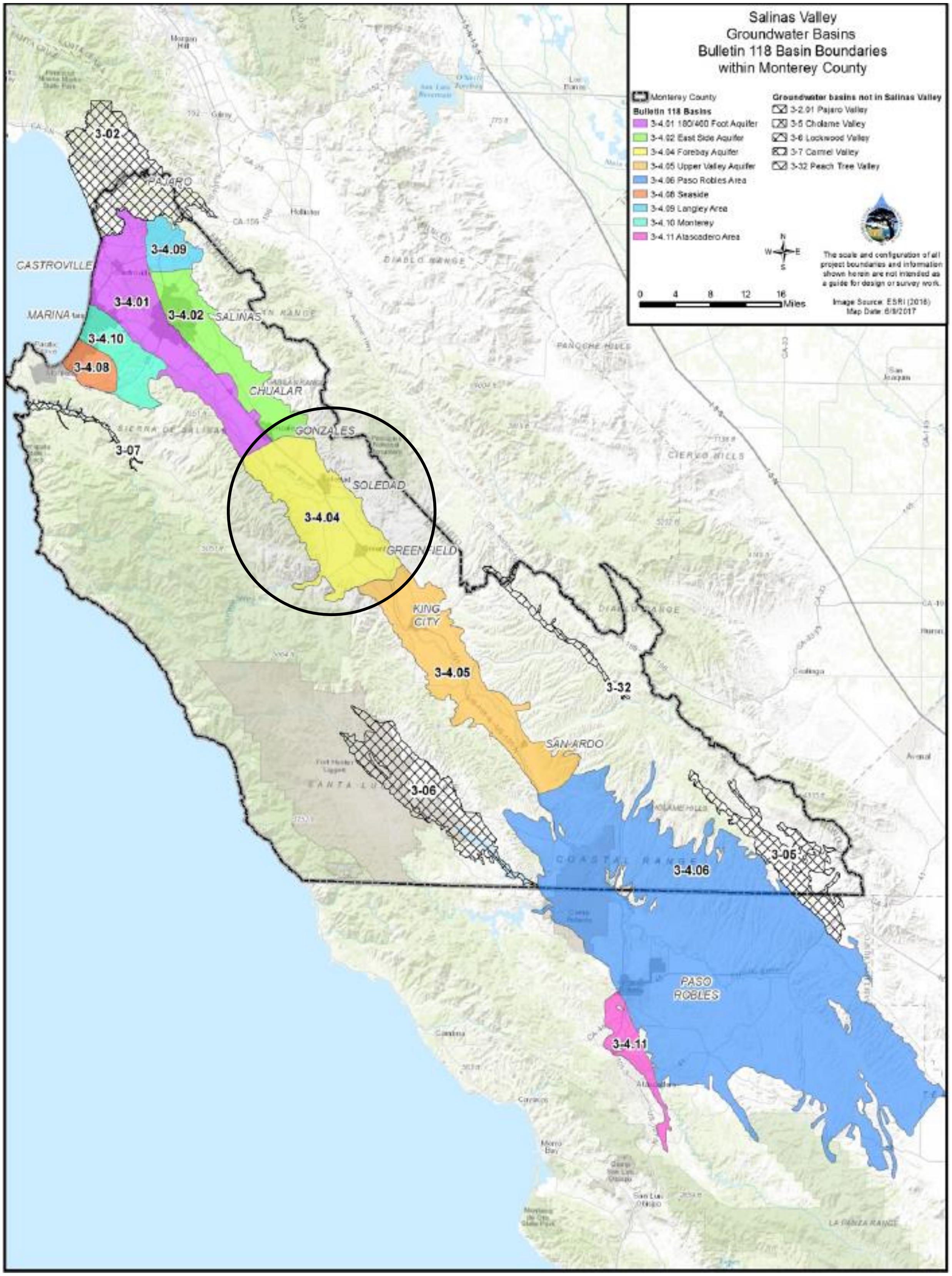
FIGURE 6-2: CASGEM GROUNDWATER BASIN PRIORITIZATION FOR THE CENTRAL COAST HYDROLOGIC REGION



Basin Ranking	Basin Count per Rank	Percent of Total for Hydrologic Region: GW Use	Percent of Total for Hydrologic Region: Overlying Population
High	8	45%	48%
Medium	16	46%	48%
Low	1	6%	0%
Very Low	35	3%	4%
Totals	60	100%	100%

Source: California Water Plan Update 2013 Central Coast Hydrologic Region, Regional Report, Volume 2.

FIGURE 6-3: MAJOR GROUNDWATER BASINS IN THE GREATER MONTEREY COUNTY IRWM REGION



- **Plan Element 6:** Short-Term and Long-Term Water Quality Management
- **Plan Element 7:** Continued Integration of Recycled Water
- **Plan Element 8:** Identification and Mitigation of Groundwater Contamination
- **Plan Element 9:** Identification and Management of Recharge Areas and Wellhead Protection Areas
- **Plan Element 10:** Identification of Well Construction, Abandonment, and Destruction Policies
- **Plan Element 11:** Continuation of Local, State and Federal Agency Relationships
- **Plan Element 12:** Continuation of Public Education and Water Conservation Programs
- **Plan Element 13:** Groundwater Management Reports
- **Plan Element 14:** Provisions to Update the Groundwater Management Plan

The MCWRA owns and operates two reservoirs that specifically serve to optimize management of the groundwater basin. These reservoirs, named Nacimiento and San Antonio, help manage groundwater use by ensuring farms throughout the Salinas Valley can have water year-round. MCWRA uses the reservoirs to store excess winter flows and release them in the summertime, when most crops are grown but rain is scarce, so that the Salinas River can recharge the groundwater basin throughout the year.

Salinas Valley: Valley-Wide Integrated Groundwater Sustainability Plan (Appendix F). In 2014, the State of California enacted the Sustainable Groundwater Management Act (SGMA). This law requires groundwater basins or subbasins that are designated as medium or high priority to be managed sustainably. As stated earlier, DWR has designated Forebay Aquifer Subbasin as a medium priority basin. Satisfying the requirements of SGMA generally requires four activities: (1) Forming one or more Groundwater Sustainability Agency(s) (GSAs) in the basin; (2) Developing a Groundwater Sustainability Plan (GSP); (3) Implementing the GSP and managing to measurable, quantifiable objectives; and (4) Regular reporting to the DWR. A GSA is a local agency responsible for developing the GSP in its area of responsibility.

The Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA) is a GSA that was formed in 2017. The SVBGSA represents agriculture, public utility, municipal, county, and environmental stakeholders and is responsible for developing GSPs in much of the Salinas Valley.

The SVBGSA is currently developing GSPs for all or part of six subbasins in the Salinas Valley Groundwater Basin (Valley), including the 180/400 Foot Aquifer Subbasin (3-4.01), the East Side Aquifer Subbasin (3-4.02), the Forebay Aquifer Subbasin (3-4.04), the Upper Valley Aquifer Subbasin (3-4.05), the Langley Area Subbasin (3-4.09), and the Monterey Subbasin (3-4.10).

Salinas Valley: Forebay Aquifer Subbasin Groundwater Sustainability Plan (Appendix F). The groundwater level in the Forebay Aquifer has declined somewhat in recent decades, and many wells were impacted or rendered unusable during the 2012 to 2016 drought. The purpose of this GSP is to outline how the SVBGSA and Arroyo Seco Groundwater Sustainability Agency (ASGSA) will address the declining groundwater conditions and achieve groundwater sustainability in the Forebay Aquifer Subbasin. Sustainability is the absence of undesirable results for any of the six sustainability indicators applicable in the Subbasin: groundwater elevation declines, groundwater storage reductions, seawater intrusion, water quality degradations, land subsidence, and interconnected surface water depletion. Sustainability must be achieved in 20 years and maintained for an additional 30 years.

The Forebay Aquifer Subbasin falls partially within the jurisdiction of the SVBGSA and partially within the jurisdiction of the ASGSA (Figure 6-4). The GSA boundaries overlap; therefore, neither GSA is considered an exclusive GSA in the Subbasin. Only exclusive GSAs can submit GSPs to DWR. The two GSAs will, therefore, remedy the overlap before the current draft GSP is finalized and submitted to DWR.

Salinas Valley Integrated Sustainability Plan. Although SGMA requirements dictate the development of a stand-alone GSP for each subbasin, groundwater management is a valley-wide challenge. Projects and actions implemented in one subbasin have the potential to affect other subbasins in the Valley. Recognizing the interdependence among the subbasins, the SVBGSA has developed the Salinas Valley Integrated Sustainability Plan (ISP) (January 2020). The ISP describes the ISP area, establishes local sustainable management criteria, provides projects and programs for reaching sustainability throughout the ISP area by 2040, and includes monitoring and reporting protocols to document long-term sustainable management in the ISP area.

The projects and programs presented in the ISP constitute a cohesive set of projects and programs designed to achieve sustainability throughout the entire ISP area. Each of the six subbasin GSPs developed by the SVBGSA is a subset of the ISP. The ISP includes all of the sustainable management criteria, projects and actions, and monitoring protocols included in each of the six subbasin GSPs. The ISP serves as the overarching document that guides groundwater management throughout the Salinas Valley.

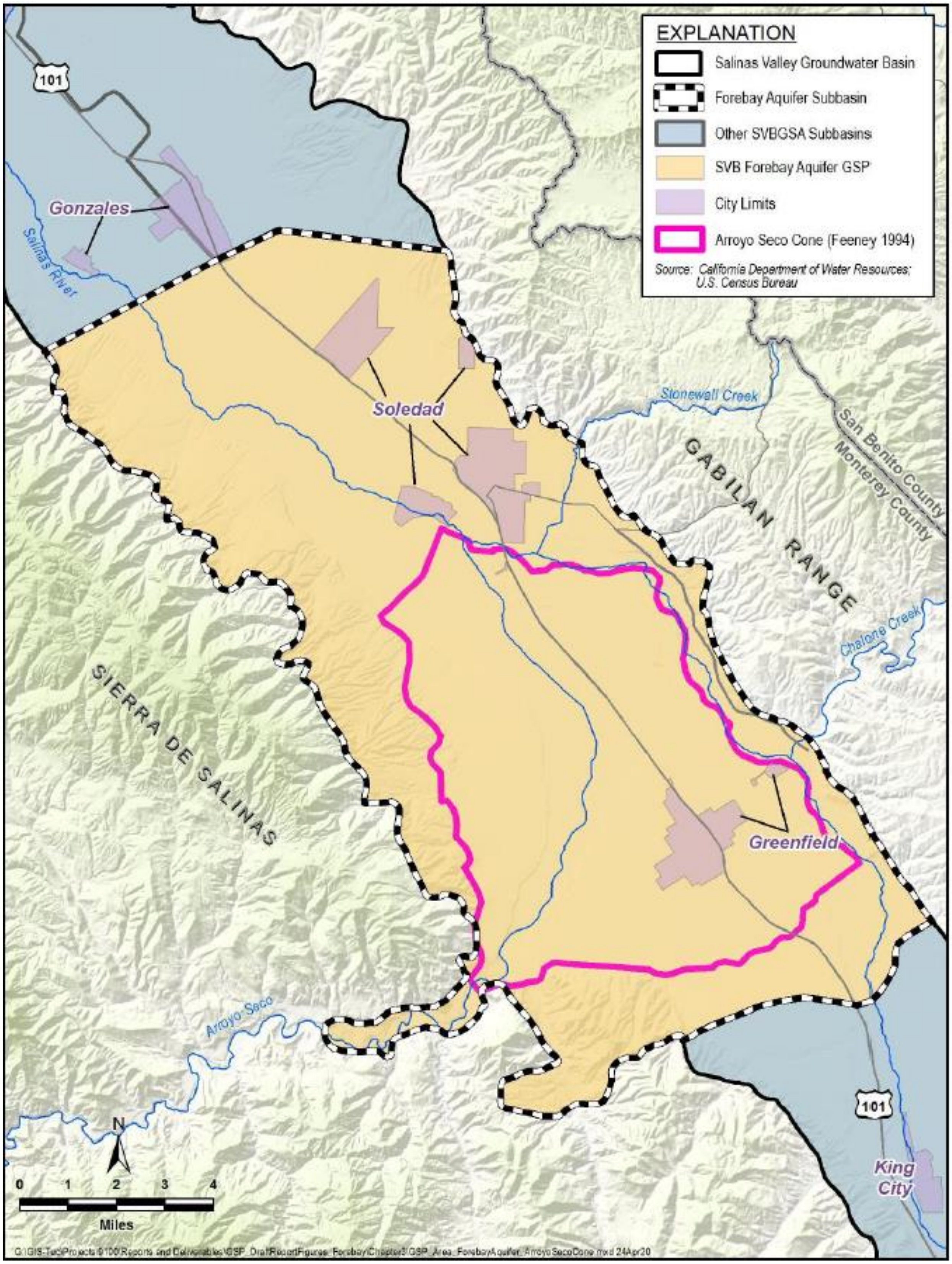
6.2.2.3 MANAGING OVERDRAFT AND CHANGE IN STORAGE

The Forebay Subarea is not an adjudicated groundwater basin and overdraft has not been a historical problem. The 2006 MCWRA GMP concluded that the groundwater levels in the Forebay Subarea are historically characterized by general stability. Even during periods of severe drought, drawdown in the Subbasin had been limited to 15 to 20 feet. This stability is due in part to the subarea's location just downstream of the confluence of the Salinas River and the Arroyo Seco groundwater subarea. The stability in the Forebay Subarea groundwater levels is significantly connected to the management of the Salinas Valley Groundwater Basin by the MCWRA.

The primary surface water body in the Forebay Subbasin is the Salinas River. This river runs through the entire length of the Subbasin and is fed by local tributaries. The largest and most important tributary is the Arroyo Seco. The Arroyo Seco is a tributary with a 275-square-mile drainage area that has no dams and is characterized by both very high flood flows and extended dry periods.

The MCWRA GMP underscores the importance of understanding the sustainable yield that can be supported by the Salinas Valley Groundwater Basin, during both normal and dry water years. To minimize the risk of basin overdraft, MCWRA actively recharges the basin through supplemental recharge during wet and normal periods with releases of water from the Nacimiento and San Antonio Reservoirs.

FIGURE 6-4: FOREBAY AQUIFER SUBBASIN AREA COVERED BY THE GSP



The Greater Monterey County IRWM Plan,[5] adopted in 2013 and updated in 2018, also highlights that the significant surface waters of the Greater Monterey County IRWM region include the Salinas River in the Salinas Valley and its tributaries—the San Antonio and Nacimiento Reservoirs.

These reservoirs, constructed to control flooding and to increase recharge from the Salinas River, are located outside of the Subbasin but are important controls on the rate and timing of Salinas River flows in the Subbasin:

- Lake Nacimiento, in San Luis Obispo County, was constructed in 1957 and has a storage capacity of 377,900 AF (MCWRA, 2015b).
- Lake San Antonio, in Monterey County, was constructed in 1967 and has a storage capacity of 335,000 AF (MCWRA, 2015b).

Groundwater recharge in the Salinas Valley is principally from infiltration from the Salinas River, Arroyo Seco, and to a much lesser extent, other tributaries to the Salinas River, and from deep percolation of rainfall. Both natural runoff and conservation releases from Nacimiento and San Antonio Reservoirs contribute to the flow in the Salinas River. It is estimated that stream recharge accounts for approximately half of the total basin recharge. The recharge area is generally believed to end at a point between Chualar and the City of Salinas. Average precipitation in the Salinas Valley ranges from 15 to 60 inches in the mountain ranges on either side of the valley and from 10 to 15 inches within the valley itself. Most of the precipitation occurs in winter, from November through March. Deep percolation of applied irrigation water is the second largest component of the groundwater budget, but because it represents recirculation of existing groundwater rather than an inflow of "new" water, it is not considered a source of recharge.

Since April 2010, with the implementation of the Salinas Valley Water Project, flows are managed to provide increased recharge in the Salinas River channel and to deliver river water from the Salinas River Diversion Facility to the seawater intrusion area, thus reducing the pumping stress on the aquifer system, reducing seawater intrusion advancement, and reducing or eliminating overdraft in the subbasins. The Salinas Valley Water Project consisted of modifying the Nacimiento reservoir spillway to allow for increased flow in the Salinas River during the summer. A rubber inflatable dam was put in place near the City of Marina to increase water diversions for irrigation and to mitigate saltwater intrusion in the northern reaches of the Salinas Valley Groundwater Basin. Annual recharge in the Forebay Aquifer Subbasin due to the increase of flow from the Nacimiento reservoir was expected to increase by approximately 18,000 AF.

The Salinas Valley Groundwater Basin serves as a water storage reservoir for multiple groundwater use sectors in the Salinas Valley. Every year, groundwater stored in the Basin is used to accommodate the difference in timing between water availability in the wet season and irrigation, municipal, and industrial water demand in the dry season. In addition, and of likely greater net value to the economy of the Salinas Valley, is the significant volume of year-to-year groundwater storage that allows municipalities and growers to continue obtaining water during the multi-year droughts that are common to the region.

[5] http://www.greatermontereyirwmp.org/documents/plan/.

The ISP adopted the concept of change in usable groundwater storage, defined as the annual average increase or decrease in groundwater that can be safely used for municipal, industrial, or agricultural purposes. Change in usable groundwater storage is the sum of change in storage due to groundwater level changes and the change in storage due to seawater intrusion.

Of the Salinas Valley subbasins, the Forebay Subbasin shows the second to lowest long-term loss of groundwater storage (ISP, January 2020). Until 1984, the Forebay often had more water in storage than during the base year of 1944, and the cumulative loss of groundwater storage was above the zero line. These large amounts of groundwater in storage correlate to the operation of Nacimiento Dam. Since 1984, the Forebay Subarea experienced a slow decline in cumulative groundwater in storage. During dry cycles, the Forebay Subbasin is subject to larger decreases in storage than the Upper Valley Subbasin. The average annual storage loss due to lowering groundwater levels in the Forebay Subbasin between 1944 and 2017 was approximately 1,800 AFY.

The average annual storage loss due to lowering groundwater levels in Salinas Valley between 1944 and 2017 is approximately 9,000 AFY. Changes in the total basin groundwater storage can be divided into the following three periods: 1944 to 1947 – decrease of 300,000 AF in groundwater storage, 1947 to 1998 – no clear upward or downward trend in the change in groundwater storage, and 1998 to 2017 – decrease of approximately 460,000 AF in groundwater storage. Throughout the record, there were frequent periods when the Salinas Valley saw groundwater storage fluctuations of approximately 200,000 AF, suggesting the storage capacity of the Salinas Valley can be exercised and refilled under normal conditions.

The total change in groundwater storage is the sum of the changes in groundwater storage due to groundwater level changes and seawater intrusion. Seawater intrusion does not influence the change in storage in the Eastside, Forebay, or Upper Valley subareas. Seawater intrusion adds 14,000 AF of lost groundwater storage to the combined 180/400-Foot Aquifer Subbasin and the Monterey Subbasin, for a total annual change in storage of 23,000 AF for the Salinas Valley. Of this amount, 1,800 AFY is attributed to the Forebay Subbasin.

6.2.2.4 HISTORICAL GROUNDWATER PUMPING – PAST FIVE YEARS

There are five existing groundwater wells located throughout the City—Wells 6, 7, 9, 10, and 11 (Figure 6-5). The combined existing supply capacity for the five active groundwater wells is approximately 4,788 gallons per minute (gpm) (6,917 afy). The firm capacity of these wells, designated as the total capacity when the largest unit is out of service, is approximately 3,260 gpm (5,258 afy).[6] The City's active wells are capable of meeting the existing demands.

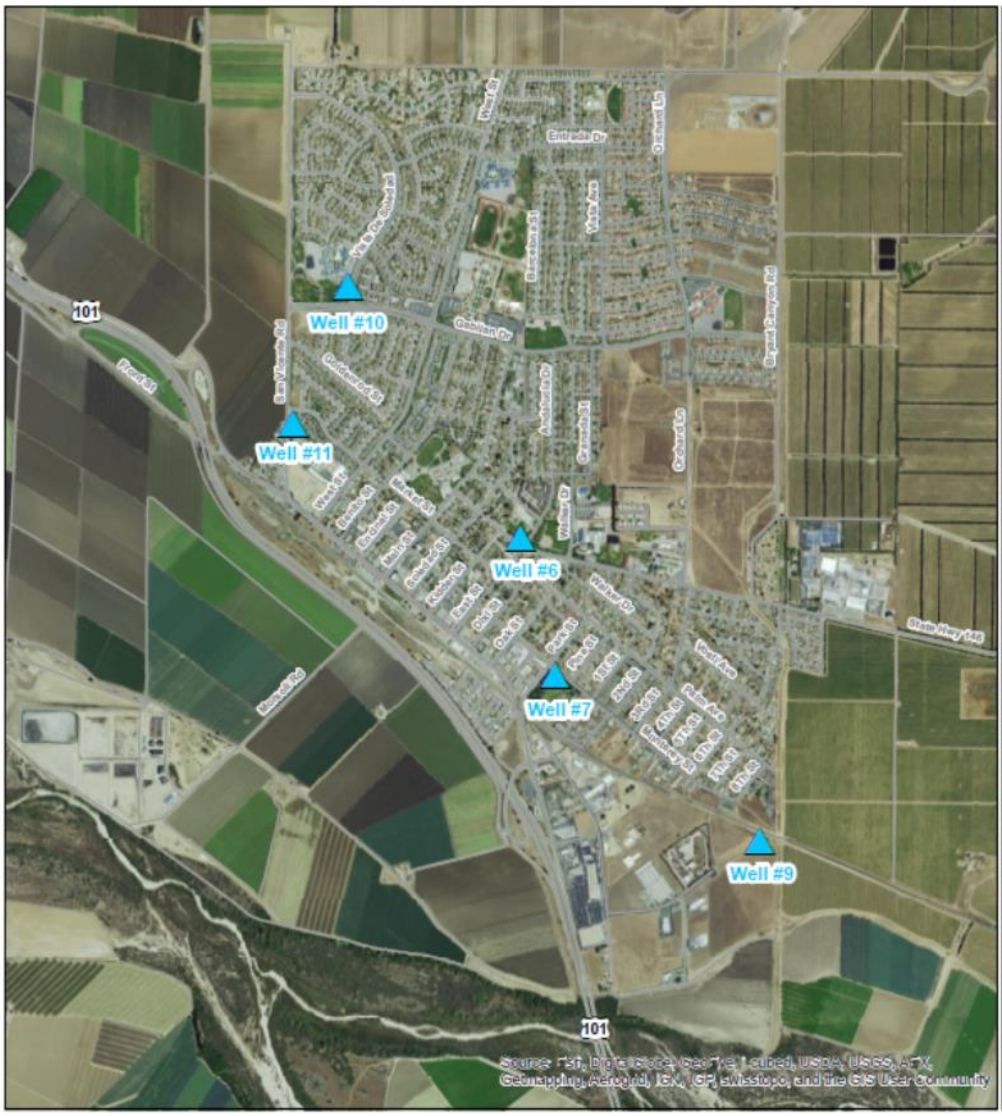
The volume of groundwater pumped by the City over the past five years is summarized in Table 6-1. Historically, the Forebay Subarea has adequately met the City's water demands, and it is anticipated that the Subbasin will adequately meet the City's water demands in the future.

[6] City of Soledad Water System Master Plan, Table 2.1.

TABLE 6-1: GROUNDWATER VOLUME PUMPED PAST FIVE YEARS

GROUNDWATER TYPE	LOCATION OR BASIN NAME	VOLUME (AF)				
		2016	2017	2018	2019	2020
Alluvial Basin	Salinas Valley Groundwater Basin, Forebay Aquifer Subbasin, Forebay Subarea	1,931	2,085	2,073	2,124	2,264

FIGURE 6-5: EXISTING GROUNDWATER WELL LOCATIONS



6.2.2.5 GROUNDWATER ELEVATION AND QUALITY MONITORING

The MCWRA has an existing monitoring program focused on monitoring water supply levels and water quality changes over time. MCWRA currently monitors 11 wells with publicly available data within the Forebay Aquifer Subbasin as part of the CASGEM network; nine are owned by MCWRA, and others are privately owned. This network will be used for long-term water elevation monitoring under GSP implementation. Groundwater quality data will be downloaded and reviewed from existing networks and programs for public water system wells, small public water system wells that are monitored by the County Department of Public Health, and the Irrigated Lands Program agricultural and domestic wells monitored under the existing Ag Order.[7]

Conditions currently tracked by the MCWRA include seawater intrusion, nitrate, and other groundwater quality conditions; factors influencing basin balance (i.e., data for rainfall stream flows, reservoir operations, groundwater levels); and land use and water needs. Two major water quality problems affecting the Salinas Valley Groundwater Basin are nitrate contamination and seawater intrusion.

Water quality is also monitored by the City. The City is required to collect water quality samples on a routine basis for compliance monitoring and reporting to the State Water Resources Control Board (SWRCB) Division of Drinking Water. The City publishes an Annual Water Quality Report, the most recent in May 2021 for reporting year 2020.[8] Arsenic, nitrate, and lead are highlighted to educate customers on the occurrence, standards, and health effects. The 2020 Water Quality Report shows no regulated substances exceeded the maximum contaminant level (MCL).[9]

The water quality information that follows on nitrate contamination is from the Greater Monterey County IRWM Plan, which was excerpted from Technical Memorandums to EPA Region IX from MCWRA, dated July 30, 2010 (MCWRA 2010a and MCWRA 2010b).

Nitrate Contamination. Nitrogen, in the form of nitrate (NO_3), is the most significant nutrient affecting groundwater quality in the lower Salinas River watershed (Greater Monterey County IRWM Plan, 2018). The U.S. Environmental Protection Agency (EPA) established the drinking water standard (DWS) and health advisory level of 45 mg/l NO_3 in California, also known as the MCL. The MCL in California has been changed to 10 mg/l NO_3-N (Nitrate Nitrogen) to be consistent with other states; however, the IRWM Plan continues to use the former standard notation of 45 mg/l NO_3.

Levels of nitrate in groundwater that exceed that level pose a threat to human health and to other biological organisms that depend on groundwater. Particularly in rural, private wells, incidence of methemoglobinemia, or blue baby syndrome, appears to be the result of high nitrate levels. Nitrate may also interact with organic compounds to form N-nitrosamines, which are known to cause cancer (Mahler, Colter, and Hirnyck 2007). Many organic compounds could link with nitrate to form N-nitrosamines, including some pesticides. This is potentially significant because wells with high nitrate

[7] The Central Coast Water Board is mandated to regulate discharges from commercially irrigated agricultural lands to protect surface waters and groundwater. The Agricultural Order is the permit that the Central Coast Water Board uses to authorize and regulate agricultural discharges, including pesticides, nutrients, and sediments discharging to surface waters through irrigation, tile drain, and stormwater discharge, and nutrients and pesticides discharging to groundwater through percolation. General Waste Discharge Requirements for Discharges from Irrigated Lands, Order No. R3-2021-0040, April 15, 2021, State Water Resources Control Board, Central Coast Region.

[8] https://cityofsoledad.com/wp-content/uploads/Public-Works/Water/2020-Water-Quality-Report-Dated-May-2021.pdf.

[9] MCL: The highest level of a contaminant that is allowed in drinking water.

levels are also sometimes associated with high pesticide levels. Neither the immediate nor the chronic health effects of N-nitrosamines in humans are well understood.

Nitrate contamination in the Salinas Valley was first documented in a report published by AMBAG in 1978. Nitrate may occur naturally in groundwater due to biologic activity or decomposition of geologic deposits, but rarely do natural concentrations exceed the Primary DWS of 45 mg/l NO_3. Nitrate contamination in the Salinas Valley is due primarily to the use of nitrogen-based synthetic fertilizers for irrigated agriculture, and commonly occurs in the unconfined and semi-confined aquifers that underlie areas of intense agricultural activity. However, nitrate contamination can also be caused from septic system failures, from wastewater treatment ponds located in floodplains that convey sewage during flood events, and from livestock waste.

Nitrate contamination is present throughout the Salinas Valley in varying concentrations. In 2007, 37 percent of the 152 wells sampled in the Salinas Valley Groundwater Basin showed nitrate levels greater than the MCL of 45 mg/l NO_3, with concentrations highest in the Upper Valley and East Side Subareas. In the Upper Valley Subarea, 68 percent of wells had nitrate concentrations reported at greater than the MCL, with a maximum concentration of 425 mg/L NO_3 and a mean concentration of 90 mg/L NO_3; and in the East Side Subarea, 60 percent of wells had nitrate concentrations reported at greater than the MCL, with a maximum concentration of 502 mg/L NO_3 and a mean concentration of 106 mg/L NO_3.

In 2010, MCWRA reported that the Forebay Subarea had 41 wells sampled, reporting the Mean NO_3 (mg/l) at 79, Median Concentration NO_3 (mg/l) at 54, and Maximum Concentration NO_3 (mg/l) of 290. At that time, the percentage of wells greater than the MCL was 54 percent.[10]

The MCWRA has documented increasing trends of nitrate levels in the Salinas Valley Groundwater Basin between 1993 and 2007. In 1993, 370 wells were sampled, and in 2007, 152 wells were sampled; 96 of those wells were sampled in both years. The change in groundwater nitrate concentration in those 96 wells ranged from a maximum 75 mg/L decrease to a maximum 255 mg/L increase. Between 1993 and 2007, the percentage of wells sampled within the Salinas Valley Groundwater Basin with concentrations of NO_3 greater than the DWS increased from 25 percent to 37 percent. Comparison of Nitrate-NO_3 concentrations for the Forebay Subarea study wells showed a Mean Change of +38 mg/L, a Median Concentration change of +21 mg/L, and the percent of wells greater than the MCL increased from 36 percent to 54 percent.

All of the Salinas Valley cities, including Soledad, have had to replace domestic water wells due to high nitrate levels that exceeded the drinking water standard.

The City's 2020 Water Quality Report shows Nitrate as nitrogen (NO_3-N) at 0.44 mg/L, not exceeding the MCL of 10 mg/L. Other regulated substances reported in the City's 2020 Water Quality Report include arsenic, barium, chromium, fluoride, gross alpha particle activity,

[10] Technical Memorandum from MCWRA to EPA Region IX, dated July 30, 2010 (MCWRA 2010a) (Greater Monterey County IRWM Plan, Section B, Table B-20).

haloacetic acids, hexavalent chromium, selenium, and total trihalomethanes, none of which exceeded their MCL.

6.2.3 SURFACE WATER

At the time of preparation of the 2020 UWMP, and consistent with previous UWMPs, the City does not use surface water as part of its water supply.

6.2.4 STORMWATER

Through 2020 and consistent with previous UWMPs, the City does not use stormwater as part of its water supply. However, the City collects stormwater in recharge basins throughout the City, which helps to recharge the groundwater subbasins, but this recharge is not included in the City's supply calculations.

6.3 WASTEWATER AND RECYCLED WATER

Treated wastewater is considered a reliable and drought-proof water source and could greatly reduce reliance on the use of limited groundwater supplies both in the City's service area and throughout the region.

Recycled water is a critical part of the California water picture because of the high likelihood of drought. Reuse opportunities have continued to grow with public acceptance and increased economic viability. As treatment technology continues to improve, demand for recycled water will also increase. Recycled water provides flexibility and increases reliability during drought conditions as other water supplies diminish.

Recycled water is wastewater that is purified through primary, secondary, and tertiary treatment and can be used for most beneficial non-potable water purposes, such as landscape irrigation, as well as commercial and industrial processes defined by Title 22 requirements. The term "recycled water" is defined in the CWC more broadly than "municipal recycled water." For purposes of this UWMP, "recycled water" means only municipal recycled water;—that is, water that has been treated and discharged from a municipal wastewater facility.

This section discusses the use of recycled water and the characteristics of the wastewater treated at the City-owned and operated treatment plant. As required by Water Code Section 10633, the UWMP provides, to the extent available, information on recycled water and its potential for use as a water source in the City's service area.

6.3.1 RECYCLED WATER COORDINATION

The City is the sole agency responsible for the collection, treatment, and disposal of wastewater within the City's service area. Therefore, coordination of treatment and use of recycled water remains solely with the City.

6.3.2 WASTEWATER COLLECTION, TREATMENT, AND DISPOSAL

6.3.2.1 WASTEWATER COLLECTED WITHIN SERVICE AREA

The City maintains and operates a wastewater collection system that serves all properties within the city, including two state prison facilities, and a nearby agricultural processing facility on Camphora-Gloria Road outside the city limits.

The City operates one wastewater treatment plant located one mile southwest of the City. The City completed an upgrade and expansion of its wastewater treatment plant in January 2010 that increased plant treatment capacity from 3.1 MGD to 5.5 MGD with a disposal capacity of 4.3 MGD. The plant also treats wastewater to meet tertiary requirements for recycled water use. With completion of the project, the plant meets the effluent limits adopted by the SWRCB.

This expansion allows for additional growth beyond the current city limits. The City's unused sewer capacity is sufficient to accommodate housing development on the City's vacant and underutilized residential sites. In addition, the City contractually provides wastewater treatment services through its plant to two state prisons that are within City boundaries.

The total amount of wastewater collected within the City's service area was approximately 102.56 AF in 2020 (Table 6-2).

TABLE 6-2: WASTEWATER COLLECTED WITHIN THE SERVICE AREA IN 2020

WASTEWATER COLLECTION*			RECIPIENT OF COLLECTED WASTEWATER			
Name of Wastewater Collection Agency	Wastewater Volume Metered or Estimated?	Volume of Wastewater Collected from UWMP Service Area 2020 (AF)	Name of Wastewater Treatment Agency Receiving Collected Wastewater	Treatment Plant Name	Is WWTP Location Within the UWMP Area?	Is WWTP Operation Contracted to a Third Party?
City of Soledad	Metered	102.56	City of Soledad	City Water Reclamation Facility	Yes	No

*100 percent of the City's 2020 service area and its population are covered by wastewater collection system

6.3.2.2 WASTEWATER TREATMENT AND DISCHARGE WITHIN SERVICE AREA

The City transports wastewater to the City's Water Reclamation Facility (WRF). The WRF is a Title 22 Tertiary Water Reclamation Facility that treats wastewater generated throughout the city and from both of the prisons, Salinas Valley State Prison and the Correctional Training Facility.

Pretreatment of wastewater occurs at separate facilities for the City and the prisons due to safety and security concerns with the wastewater collected from the prisons. Following pretreatment, wastewater is combined upon entering the WRF and receives preliminary, secondary, and tertiary treatments. The preliminary treatment involves perforated plate screening and vortex grit removal. The secondary treatment utilizes four-phase biological nutrient removal processes and clarification, while the tertiary treatment includes flocculation to remove suspended solids and filtration and ultra-violet treatment for disinfection purposes. The sludge produced from the treatment of the wastewater also receives residual treatment, which involves stabilization and screw press dewatering. Treated wastewater not reused as a part of the treatment process is percolated into the ground through the City's rapid infiltration basins. The City's treatment and discharge of wastewater is summarized in Table 6-3.

TABLE 6-3: WASTEWATER TREATMENT AND DISCHARGE WITHIN THE SERVICE AREA IN 2020

WASTEWATER TREATMENT PLANT NAME	DISCHARGE LOCATION NAME AND DESCRIPTION	METHOD OF DISPOSAL	DOES THIS PLANT TREAT WASTEWATER GENERATED OUTSIDE THE SERVICE AREA?	TREATMENT LEVEL	2020 VOLUME (AF)			
					WASTEWATER TREATED (AF)	DISCHARGED TREATED WASTEWATER	RECYCLED WITHIN SERVICE AREA	RECYCLED OUTSIDE OF SERVICE AREA
City Water Reclamation Facility	On-Site Rapid Infiltration Basins	Percolation Ponds	Yes	Tertiary	102.56	98.51	0	0

6.3.3 CURRENT RECYCLED WATER SYSTEM

Currently, all treated effluent from the WRF is disposed of via rapid infiltration basins. This water percolates back into the aquifer, serving as a source of groundwater recharge. DWR guidelines stipulate incidental recharge from treated wastewater effluent disposal in percolation ponds is not counted as groundwater recharge or recycled water use; therefore, this disposal volume is not included in the recycled water use projections. The WRF is the only facility that uses recycled water; it is used for fire suppression and process water.

In 2007, the City adopted an ordinance requiring ongoing monitoring of wastewater effluent quality. The City has prepared a Recycled Water User's Manual, which has been approved by the California Department of Public Health (CDPH).

In 2010, the City completed an upgrade of its WRF to meet the tertiary treatment requirements outlined in the Regional Water Quality Control Board (RWQCB) order WRR R3-2008-0042. This order required the City to upgrade the WRF to meet Title 22 of the California Code regarding the production of recycled water. Construction included upgrade to 5.5 million gallons/day (MGD), with a plan to provide tertiary treated water for agricultural, recreational, and urban landscape irrigation areas. The delivery system had not yet been constructed.

Through Round 1 of the Proposition 84 IRWM Implementation Grant program, the City received funds to construct the recycled water pump station and design and construct the transmission mains needed to connect the recycled water transmission mains already constructed to the pump station. Completion of this project will enable delivery of recycled water to multiple landscaped areas currently being irrigated with potable water. The project will also include a feasibility study and preliminary conceptual design for the neighboring communities of Gonzales and Greenfield for delivery of their cities' wastewater to the Soledad Water Reclamation Facility for processing. Preliminary design of a Title 22 recycled water distribution system was complete in April 2015. A preliminary design report was completed in October 2015, which provided preliminary design recommendations and an opinion of probable cost for the recycled water system, including constructing transmission piping, connecting to the WRF disinfected tertiary effluent, and pressurizing the recycled water system. Final design of a recycled water transmission line was completed in November 2015. The City plans to complete construction in fiscal year 2021/2022.

6.3.4 RECYCLED WATER BENEFICIAL USES

6.3.4.1 CURRENT AND PLANNED USES OF RECYCLED WATER

Annual projections for the City's recycled water use are summarized in Table 6-4. It is anticipated that once all phases of the recycled water system are complete most projected landscaping demands will be met through recycled water delivery. For planning purposes, the projected recycled water volume in Table 6-4 would offset the projected landscaping demand summarized previously in Chapter 4, Table 4-3. A complete analysis of potential future recycled water use demands will be developed in the future.

TABLE 6-4: RECYCLED WATER DIRECT BENEFICIAL USES WITHIN THE SERVICE AREA, 2020–2045 (AF)

BENEFICIAL USE TYPE	POTENTIAL BENEFICIAL USES OF RECYCLED WATER	AMOUNT OF POTENTIAL USES OF RECYCLED WATER	LEVEL OF TREATMENT	2020	2025	2030	2035	2040	2045
Landscape Irrigation	City-Owned Properties – parks, sports fields	Landscape Irrigation; Up to 80 AFY	Tertiary	0	49	55	65	70	80

The California Department of Corrections and Rehabilitation (CDCR) has expressed interest in a project to utilize, at CDCR's facilities, recycled water treated at the City's WRF. CDCR facilities are located on an incorporated island approximately three miles north of the City boundary, from where wastewater generated at the CDCR facilities is piped to the City's WRF for treatment and disposal.

The Soledad WRF is a Title 22, Tertiary Water Reclamation Facility that was designed and built as a 5.7 MGD facility to serve development outside of the current City limits. Those development applications have subsequently expired leaving the Soledad WRF with significant excess capacity available. This excess capacity could be utilized as a potential regional WRF should the City of Greenfield or the City of Gonzales need additional or higher level wastewater treatment capacity.

6.3.4.2 PLANNED VERSUS ACTUAL USE OF RECYCLED

The City does not currently utilize any recycled water to offset potable water use. The slower than anticipated development of the recycled water infrastructure explains the difference in recycled water volume projected for 2020 in the 2015 UWMP and the actual use in 2020. This difference is shown in Table 6-5.

TABLE 6-5: 2015 UWMP RECYCLED WATER USE PROJECTION COMPARED TO 2020 ACTUAL

USE TYPE	2015 PROJECTION FOR 2020 (AF)	2020 ACTUAL USE (AF)
Landscape Irrigation – City-Owned Property – Parks and Sports Fields	108	0
TOTAL	**108**	**0**

6.3.5 ACTIONS TO ENCOURAGE AND OPTIMIZE FUTURE RECYCLED WATER USE

Since 2007, the City has required all new development, excluding infill development, to install recycled water distribution infrastructure. This infrastructure will allow for the use of recycled water for outdoor water uses, which will be encouraged upon the completion of the recycled water distribution system. Recycled water will be used for landscape irritation, including parks, ball fields, and school district open space.

The City continues to identify and support actions to expand future recycled water use. Table 6-6 lists these actions to encourage recycled water use and the expected increase in use. For conservative planning purposes, each action totals to the 2045 projected recycled water use of 80 AF as shown in Chapter 4, Table 4-4.

TABLE 6-6: METHODS TO EXPAND FUTURE RECYCLED WATER USE

NAME OF ACTION	DESCRIPTION	PLANNED IMPLEMENTATION YEAR	EXPECTED INCREASE IN RECYCLED WATER USE (AF)
Establish Recycled Water Distribution System	Connect recycled water distribution system to City parks and ball fields	2025	39
Service Area Recycled Water Expansion	Expand recycled water distribution system throughout City service area to irrigate parks, parkways, and open spaces	2030	6
New Development Recycled Water Infrastructure	Planned phased development to expand RW distribution system to irrigate parks, parkways, and slopes	2030–2045	25
Subsidized Costs	Establish recycled water funding program to offset/subsidize costs	2025–2045	2

TABLE 6-6: METHODS TO EXPAND FUTURE RECYCLED WATER USE

NAME OF ACTION	DESCRIPTION	PLANNED IMPLEMENTATION YEAR	EXPECTED INCREASE IN RECYCLED WATER USE (AF)
Regulatory Relief	Ease regulations to install recycled water infrastructure	2025–2045	2
Regional Planning	Regionalize recycled water planning for collaboration and cost benefits	2025–2045	2
Long-Term Contracts	Advantages for long-term recycled water contracts	2025–2045	2
Rate Discounts	Financial program to incentivize recycled water use	2025–2045	2
	TOTAL	**80**	

6.4 DESALINATED WATER OPPORTUNITIES

The groundwater under the City is not brackish in nature and does not require desalination. The City's groundwater source is expected to adequately meet the long-term supply needs of the City in the future, and as such, transport of desalinated water is not expected to be necessary.

6.5 WATER EXCHANGES AND TRANSFERS

There are currently no known exchanges, transfers, or interties that exist between the City and any other water system.

6.6 FUTURE WATER PROJECTS

The City's recent Water System Master Plan recommends capital improvement projects to mitigate hydraulic deficiencies, including improved water supply.

Supply. The Master Plan concluded that there was surplus existing supply in all pressure zones—A, B, and C. The Master Plan analyzed the sufficient sources of supply to support demand requirements in each pressure zone. As development ensues, additional groundwater supply in Zone A will be required. There are two-underperforming wells—Well 7 and Well 10—that would benefit from upgrades and defer the need to drill new wells to satisfy future supply requirements. Well 7 is operating at 54 percent efficiency, and Well 10 is operating at 48 percent efficiency. A reasonable target for efficiency is 70 percent based on common industry practice. Therefore, upgrades of both Well 7 and Well 10 are considered high-priority supply projects. The small supply deficiency in Zone B at build out can be resolved by operational control.

Storage. The Water System Master Plan also analyzed sufficiency of storage capacity in each operating zone. The analysis considered fire storage, emergency storage, and operational storage. The Master Plan analysis concluded that there will be a surplus at build out in all operational zones and, therefore, no recommendation for storage improvement projects.

Distribution. The Water System Master Plan presents the findings of the hydraulic modeling analysis of the City's water system and the recommended infrastructure upgrades to meet current and future demands. Distribution system pressure and pipe velocity infrastructure upgrade recommendations include residential and commercial, industrial, and institutional (CII) water main upgrades and fire hydrant spacing gap projects.

The City anticipates additional hydraulic modeling analysis within the water service area that is being built out to ensure a sufficient water supply and good water quality for the new developments.

High-Priority Projects. The Water System Master Plan identifies a list of high-priority projects, including residential water main (pipeline) upgrades, CII water main upgrades, residential and CII fire hydrant spacing gap projects, Zone C boundary reconfiguration for system pressure and fire flow, a system condition assessment to determine the remaining service life of each component of the distribution system, and two well upgrades to increase capacity and efficiency. The distribution projects are identified here for information, although they are not detailed since they are not specifically water supply projects that increase the amount of water supplied to the City.[11]

The two well upgrade projects are included as supply projects since they provide improved efficiency in meeting water demands, and are described as follows:

Well 7 Efficiency Upgrade is recommended to achieve higher capacity and efficiency. The project will replace the pump and the motor. Well 7 is operating at an efficiency of 54 percent, when 70 percent is recommended. The efficiency test shows that improvements to the motor are anticipated to result in a flow rate of 1,411 gpm, an increase of 316 gpm (510 AFY) or 29 percent. The aquifer appears to have a greater capacity than the well is currently producing and may be capable of producing up to 1,935 gpm. This increase requires upgrades to the motor, the pump and possibly to the electrical system.

Well 10 Efficiency Upgrade is recommended to achieve higher capacity and efficiency. The project will replace the pump and the motor. Well 10 is operating at an efficiency of 48 percent, when 70 percent is recommended. The efficiency test shows that improvements to the motor are anticipated to result in a flow rate of 899 gpm, an increase of 254 gpm (209 AFY) or 39 percent. The aquifer appears to have a greater capacity than the well is currently producing and may be capable of producing up to 1,005 gpm. This increase requires upgrades to the motor, the pump, and possibly the electrical system.

These well upgrades are included in Table 6-7.

[11] Refer to the City of Soledad Water System Master Plan (April 2019) for more information.

Low-Priority Projects. The Water Master Plan also identifies a list of low-priority projects, representing solutions to hydraulic deficiencies that are not urgent and whose immediate implementation will have limited benefit. Planning for these projects will be in the future pending additional study regarding age, condition, vulnerability, integration into future development, etc. Low-priority projects include additional pipeline upgrades for fire flow capacity and one new well for production capacity.

New Well in Zone A is recommended as a future project to offset a projected 500 gpm supply deficit at build out. The well would have a capacity of 500 gpm or greater, equal to approximately 807 AFY. Unless development accelerates unexpectedly, there is no urgency for this project. The new well is included in Table 6-7 for future supply planning.

TABLE 6-7: EXPECTED FUTURE WATER SUPPLY PROJECTS OR PROGRAMS

NAME OF FUTURE PROJECTS OR PROGRAMS	JOINT PROJECT WITH OTHER AGENCIES?	DESCRIPTION	PLANNED IMPLEMENTATION YEAR	PLANNED FOR USE IN YEAR TYPE[1]	EXPECTED INCREASE IN WATER SUPPLY TO CITY (AF)
Well 7 Upgrade	No	Supply sufficiency and energy efficiency	2021–2022	All Year Types	510
Well 10 Upgrade	No	Supply sufficiency and energy efficiency	2022–2024	All Year Types	209
New Well Construction – Future Project	No	New well in Zone A with a capacity of 500 gpm or greater	2036 (Pending annexation and construction at Miramonte)	All Year Types	807
Recycled Water Distribution System	No	Connect and expand existing development to recycled water and phase in new development to recycled water	2025–2045	All Year Types	80[2]

1 Year type is defined as average year, single dry year, and multiple-dry years.

2 For conservative planning purposes, the expected increase to the water supply due to the construction of the recycled water distribution system is equal to the projected landscape irrigation demand by 2045.

6.7 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

The City's groundwater supply has been sufficient to meet the City's historical demands. Table 6-8 summarizes the total amount of groundwater pumped in 2020. To meet growing demand for new development not annexed into the City's sphere of influence, new groundwater wells will have to be constructed and paid for by future development applicants.

TABLE 6-8: WATER SUPPLIES – 2020 ACTUAL

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	2020		
		ACTUAL VOLUME	WATER QUALITY	TOTAL RIGHT OR SAFE YIELD
Groundwater	Potable	2,264.26	Drinking Water	148,000
Recycled Water	Non-Potable	0	Recycled Water	n/a
	TOTAL	**2,264.26**		

The City provides water service to areas within the city through a system of municipal wells, water treatment, aboveground storage, and distribution pipes, which provide water to all areas of the city. The City has sufficient water capacity for all areas within the existing city limits and within areas designated for growth (Expansion Areas) by the 2005 General Plan. Specifically, the Water Master Plan indicates that an average daily demand of approximately 3,190 gpm would be required to serve existing and new development either proposed (Miravale III Specific Plan) or already approved (Miravale II). This demand falls within the system's total supply capacity of 5,200 gpm. The City has been proactive with respect to improving and developing its water supply system and continues to construct new wells in advance of demand from growth/development areas.

Projected water supply available through 2045 is shown in Table 6-9. The City intends to continue to use groundwater as the sole source of potable supply. The City's projected supply continues to be equal to the annual sustainable yield of the Forebay Subarea, which is estimated to be 148,000 afy. Recycled water will begin delivery for irrigation uses by 2025, increasing through 2045.

TABLE 6-9: WATER SUPPLIES – PROJECTED TO 2045

WATER SUPPLY	ADDITIONAL DETAIL ON WATER SUPPLY	PROJECTED WATER SUPPLY REASONABLY AVAILABLE VOLUME (AF)				
		2025	2030	2035	2040	2045
Groundwater	Potable	148,000	148,000	148,000	148,000	148,000
Recycled Water	Non-Potable	49	55	65	70	80
	TOTAL	**148,049**	**148,055**	**148,065**	**148,070**	**148,080**

6.8 SPECIAL CONDITIONS

Numerous special conditions may affect water supply availability, such as climate change, regulatory, and other local conditions. The following considers reasonable assertions about climate change impacts on water supply in the region, the Salinas Valley Groundwater Basin, and the Forebay Aquifer Subbasin.

6.8.1 CLIMATE CHANGE IMPACTS ON WATER SUPPLY

Weather is the behavior of the atmosphere over short periods, such as days and weeks. Climate is the long-term behavior of the atmosphere, and it is almost always expressed in averages—for example, average annual temperature, average monthly rainfall, or average water equivalent of mountain snowpack at a given time of year. Climate projections cannot predict what will happen on a given date in the future, but they can indicate what to expect from the future climate in general. Climate projections also forecast the likelihood of increasing or decreasing frequencies of extreme events such as heat waves and heavy rainfall. However, they cannot predict when those events will actually occur.

The Greater Monterey County IRWM Plan identifies a series of water-related issues and conflicts. Climate change is listed as a major category with the following impacts:

- Anticipated changes in rain patterns and intensity adding to the uncertainty of water supply and to creek instability.
- Potential impacts from sea-level rise and storm surges on coastal aquatic resources and water infrastructure.
- Exacerbation in saltwater intrusion in groundwater basins from sea-level rise.
- Anticipate increase in number and severity of wildfire events, with subsequent erosion and water quality problems.
- Potential increase in flooding.

The IRWM Plan further lists the following Water Supply impacts:

- Water supply problems associated with water quality impairments, particularly with nitrates and seawater intrusion.
- Problems with water storage and conveyance infrastructure (inadequate, leaky, or otherwise defective water systems, particularly in regard to small water system).
- Overconsumption/overdraft, specifically for irrigation and municipal supplies, including landscaping.
- Unreliable water supply in certain areas, particularly in small communities.
- Need/opportunities for increased water conservation, including gray water reuse and rainwater catchment.
- Increased environmental water needs, including fisheries and wildlife.
- Need for greater drought management.
- Need for increased public education about water supply issues.

The Salinas Valley Groundwater Basin GSP Water Supply Vulnerability Assessment estimates groundwater storage losses due to seawater intrusion would range from 8,000 to 14,000 AFY. The GSP adopts a mid-range estimate of 10,500 AFY of storage loss due to seawater intrusion in the 180/400-Foot Aquifer Subbasin, ultimately impacting overall storage for the Salinas Valley Groundwater Basin.

Decreased water supply may result due to changes in precipitation, more frequent and severe droughts, increased surface and groundwater consumption, and increased seawater intrusion (due to sea-level rise affecting coastal aquifers). Water infrastructure (wastewater and recycled water), which provides a significant secondary water supply to agriculture within the lower Salinas Valley, is vulnerable to sea-level rise and storm impacts. Climate hazards may jeopardize this infrastructure, resulting in potential loss to future water supply resiliency.

Water Budgets. Future water budgets are being developed using an evaluation version of the Salinas Valley Operations Model (SVOM), developed by the U.S. Geological Survey (USGS) and MCWRA, and a component of the Salinas Valley Integrated Hydrologic Model (SVIHM). The Forebay Aquifer Subbasin GSP projected water budgets are extracted from the SVOM, which simulates future hydrologic conditions with assumed climate change. Two projected water budgets are presented, one incorporating estimated 2030 climate change projections and one incorporating estimated 2070 climate change projections. Several modifications were made to the SVOM in accordance with recommendations made by DWR in their Guidance for Climate Change Data Use During Groundwater Sustainability Plan Development (DWR, 2018). Three types of datasets were modified to account for 2030 and 2070 projected climate change: climate data including precipitation and reference evapotranspiration, streamflow, and sea level.

The projected water budget represents 47 years of future conditions including projected climate change and sea-level rise. The future water budget simulations do not simulate a 47-year projected future, but rather simulate 47 likely hydrologic events that may occur in 2030, and 47 likely hydrologic events that may occur in 2070. The climate change projections are based on the available climate change data provided by DWR (2018).

Projected groundwater basin water budgets are useful for showing that sustainability will be achieved in the 20-year implementation period and maintained over the 50-year planning and implementation horizon.

Streamflow. DWR has provided monthly change factors for unimpaired streamflow throughout California. For the Salinas Valley Groundwater Basin and other areas outside of the Central Valley, these change factors are provided as a single time series for each major watershed. Streamflows along the margins of the Forebay Aquifer Subbasin were modified by the monthly change factors. As with the climate data, an assumption was made to extend the streamflow change factor time series through December 2014. The similarity in rainfall years at the Salinas Airport rainfall gauge could reasonably be expected to produce similar amounts of streamflow; therefore, the same years of 1981, 2002, and 2004 were repeated to represent the 2012, 2013, and 2014 streamflows, respectively.

Sea-Level Rise. DWR guidance recommends using a constant rate of sea-level rise for each of the climate change scenarios (DWR, 2018). For the 2030 climate change scenario, a sea-level rise value of 15 centimeters (5.9 inches) was used. For the 2070 climate change scenario, a sea-level rise value of 45 centimeters (17.7 inches) was used.

Subbasin Water Supply Reliability. A review of water supply sources in the 180/400-Foot Aquifer Subbasin shows that surface water supplies, as measured by the San Antonio and Nacimiento Reservoir releases to the Salinas River, allow for a reliable, yet small supply in wet and normal years. The reservoir releases also supply a stable supply of surface water in the first year of a drought by taking advantage of carry-over storage. However, the current operations do not allow for reliability in multi-year drought periods as shown in the 2002–2004 and 2007–2009 droughts. More recently, during the four-year drought from 2012 to 2015, no water was released from the reservoirs in the last two years of the drought. Although no water was released, agricultural groundwater pumping did not substantially increase in those years.

Table 6-10 lists the groundwater budget derived from the SVIHM for the Forebay Subbasin. Table 6-11 provides the projected sustainable yields.[12]

Based on these projections, the general conclusion is that the Forebay Aquifer Subbasin can be managed within its sustainable yield in the future. The projected water budgets can be interpreted as most likely future conditions; however, there is inherent uncertainty associated with using climate scenarios.

TABLE 6-10: GROUNDWATER BUDGET FOR PROJECTED CLIMATE CHANGE CONDITIONS

GROUNDWATER BUDGET – FOREBAY AQUIFER SUBBASIN	2030 (AFY)	2070 (AFY)
Groundwater Pumping	-109,700	-115,900
Net Stream Exchange	103,400	106,000
Deep Percolation	51,100	55,400
Net Flow to Eastside Aquifer Subbasin and 180/400-Foot Aquifer Subbasin	-3,100	-2,800
Net Flow From Outside Areas and Upper Valley Aquifer Subbasin	2,600	2,600
Groundwater Evapotranspiration	-33,900	-35,100
Net Storage Gain or Loss	**10,000**	**9,700**

TABLE 6-11: PROJECTED SUSTAINABLE YIELDS

	2030 PROJECTED SUSTAINABLE YIELD (AFY)	2070 PROJECTED SUSTAINABLE YIELD (AFY)	HISTORICAL SUSTAINABLE YIELD (AFY)
Groundwater Pumping	109,700	115,900	108,700
Seawater Intrusion	0	0	0
Change in Storage	10,000	125,600	110,400
Projected Sustainable Yield	119,700	125,600	110,400
% Pumping Change	9% increase	8% increase	2% increase

6.9 ENERGY INTENSITY

New to 2020 UWMPs, water suppliers must include information that could be used to calculate the energy intensity of their water service, as included in Water Code Section 10631.2(a).

Specifically, water suppliers are encouraged to include energy information, readily obtainable, for any of the following operational processes for the same 12-month period of water use reported in Chapter 4:

- To extract or divert water supplies;
- To convey water supplies to the water treatment plants or distribution system;
- To treat water supplies;

[12] Forebay Aquifer Subbasin GSP, March 25, 2021.

- To distribute water supplies through its distribution systems;
- For treated water supplies in comparison to the amount used for nontreated water supplies;
- To place water into or withdraw from storage; and
- Any other energy-related information deemed appropriate.

In DWR's methodology of energy usage, they define operational energy intensity as the total amount of energy expended by the urban water supplier on a per-acre-foot basis to take water from the location where the urban water supplier acquires the water to its point of delivery. The methodology continues to clarify by adding that urban water suppliers are only expected to report the energy use information associated within the suppliers' operational control and any energy embedded in water supplies by an upstream water supplier or wholesaler is not intended to be included within the energy intensity report. As discussed in Section 6.2.1, the City is currently 100 percent reliant on groundwater. Therefore, there are no upstream water suppliers or wholesalers to include in the energy analysis.

6.9.1 WATER DISTRIBUTION ENERGY

The methodology utilized by DWR provides strict definitions of the various water management processes. Based on these definitions 100 percent of the City's power demands on its drinking water system are classified as part of the "Distribution" process.

As discussed in Chapter 3, the City provides water service through a system of municipal wells, aboveground storage, booster pumps, control valves, and distribution pipes, which provide water to all areas of the city. The distribution system is organized into three pressure zones: Zone A, Zone B, and Zone C. Zone A serves elevations between 180 feet and 237 feet, Zone B serves elevations between 195 feet and 308 feet, and Zone C serves elevations between 223 feet and 238 feet. The City follows a Time-of-Use schedule for Pacific Gas & Electric (PG&E) during the months of May through October. Wells are shut down daily between noon and 6 p.m. to avoid peak energy rates. The La Cuesta Booster Station runs from 7 p.m. to 11 p.m. to ensure sufficient volume is available in the La Cuesta Tanks but avoids peak day pricing.

Table 6-12 presents the total system energy intensity. Energy intensity is a function of volume of water entering the system (AF) and the energy consumed (kWh), resulting in energy intensity (kWh/AF).

TABLE 6-12: POTABLE DELIVERIES ENERGY – TOTAL UTILITY*

POTABLE WATER	DISTRIBUTION
Volume of Water Entering Process (AF)	2,264
Energy Consumed (kWh)	1,679,513
Energy Intensity (kWh/AF)	741.83

Total energy consumed includes energy usage for five active wells (#6, #7, #9, #10, #11) and the La Cuesta Booster Station during the period December 19, 2019, through December 20, 2020, as shown on the energy bills. The City does not have any self-generating energy sources.

Community Choice Aggregation Program. In 2013, Monterey Bay Community Power was formed as a regionwide collaborative partnership comprised of all 21 local governments within the greater Monterey Bay area, including the counties of Santa Cruz, Monterey, and San Benito and all 18 cities location within those counties. This collaborative was created to examine the potential for a community choice energy program in the Monterey Bay region.

A feasibility study for a community choice aggregation program in the tri-county region was prepared that shows that implementing the program would provide the following multiple benefits: achieve greater local control and involvement over the provision of electric services; reduce greenhouse gas emissions; provide electric power and other forms of energy to customers at competitive prices; develop clean, local, renewable energy projects; enable wider implementation of energy conservation and efficiency projects and programs; stimulate the local economy by creating local jobs; and promote long-term electric rate stability and reliability for the residents in the tri-county area.

In March 2017, the City adopted Ordinance 708, authorizing implementation of the Community Choice Aggregate Program. The Monterey Bay Community Power Joint Powers Agreement (JPA) (Appendix G) was recommended and formed in April 2017 (approved by the City through Resolution No. 5272), and the Program began providing electrical service in spring 2018.

6.9.2 WASTEWATER AND RECYCLED WATER

Currently, the City does not serve recycled water for customer use. However, recycled water capacity is being developed and is anticipated for distribution and use for irrigation purposes by 2025. The City may be able to provide energy reporting for wastewater and recycled water in its 2025 UWMP Update.

At that time, due to the local nature of the City's recycled water program, the energy requirements will include the collection of wastewater, the treatment process, and the distribution of recycled water throughout the service area.

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7 WATER SERVICE RELIABILITY AND DROUGHT RISK ASSESSMENT

Water service reliability addresses the capability of the water supply to meet water demand during long-term droughts and emergency events in normal (average) existing conditions. The drought risk assessment in this chapter compares water service reliability during a normal year, a single dry year, and a five consecutive year drought.

During the 20th century, California experienced three significant historical statewide droughts: the six-year event of 1929 to 1934, the two-year event of 1976 to 1977, and the six-year event of 1987 to 1992. Since 2000, most years have experienced less than average annual rainfall. The statewide drought of 2007 to 2009 was soon followed by the statewide drought of 2012 to 2016. The 2007 to 2009 drought marked the first time that a statewide proclamation of emergency was issued because of drought impacts. A statewide proclamation was repeated with the 2012 to 2016 drought (DWR, 2020).

Notably, during the 2012 to 2016 drought, the state mandated that urban water suppliers reduce water use by retailer-specific percentages compared to a retailer’s baseline 2013 usage. With coordination and cooperation by the City’s customers, the City achieved its required reduction by aggressively implementing its Water Shortage Contingency Plan (Chapter 8 and Appendix I) and expanding and implementing its demand management measures (Chapter 9) to customers. Collectively, these actions ensured the City maintained water service reliability.

This chapter describes the City’s ability to meet retail customer water demands by analyzing a variety of factors that affect the City’s water supply. The CWC requires an assessment of the City’s water service reliability during average years, single dry years, and during a five consecutive year drought period to meet the water needs of its customers. This chapter also includes the discussion of a Drought Risk Assessment, a new UWMP requirement, which provides a mechanism for the City to evaluate the risk to its water supply under a drought lasting for the next five consecutive years (2021–2025).

7.1 WATER SERVICE RELIABILITY ASSESSMENT

The Groundwater Sustainability Plans, collectively for the Salinas Valley Basin (SVBGSA, 2017), replace the 2006 GMP as a critical source document for the City since it relies 100 percent on the Forebay Aquifer Subbasin for its drinking water supply. These documents include the Salinas Valley: Valley-Wide Integrated GSP and the Salinas Valley: Forebay Aquifer Subbasin GSP. The MCWRA will use the GSPs as they manage the Salinas Groundwater Basin and its subbasins.

As presented in Chapter 6, the City is developing local recycled water to meet non-potable landscape irrigation demands. However, the City will continue to rely on groundwater to provide future potable water supply to meet the projected water demands in all hydrologic scenarios. The City and its customers benefit from investments in groundwater supply reliability.

There are various factors that may impact reliability of supplies such as legal, environmental, water quality, and climatic variables, as discussed below. The City's water supplies are projected to meet full-service demands now and into the future.

7.1.1 GROUNDWATER

The City provides water service to the entire community through the operation of five active wells. The wells have a combined total pumping capacity of about 4,788 gallons per minute (gpm) and a firm capacity of 3,260 gpm.[1] The capacity is sufficient for all areas within the existing City limits and within some areas designated for growth. The City has been proactive with respect to improving and developing its water supply system and continues to construct new wells in advance of demand.

The City relies on groundwater supplies from the Forebay Aquifer Subbasin of the Salinas Groundwater Basin, managed by MCWRA. The City's water service reliability assessment is largely driven by the actions of the MCWRA working collaboratively with overlying agencies to maximize the development and reliability of groundwater supplies. The MCWRA manages the basin's water budget. The water budget provides an accounting and assessment of the total annual volume of surface water and groundwater entering and leaving the basin, including historical, current, and projected water budget conditions and the change in the volume of groundwater in storage. In other words, the water budget is an inventory of surface water and groundwater inflows and outflows from the Subbasin.

A few components of the water budget can be measured, such as groundwater pumping from metered wells and streamflow at a gaging station. Other components of the water budget are simulated by groundwater models, such as recharge from precipitation and applied irrigation, and change of groundwater in storage. The difference between groundwater inflows and outflows is equal to the change of groundwater in storage.

The MCWRA GMP underscores the importance of supporting a sustainable yield from the Salinas Valley Groundwater Basin, during both normal and dry water years. In order to minimize the risk of basin overdraft, MCWRA actively recharges the basin through supplemental recharge during wet and normal periods with releases of water from the Nacimiento and San Antonio reservoirs.

The MCWRA reports that there has not been an instance of overdraft in the Forebay Subarea since it began groundwater measurement in the 1950s. The Forebay Subarea groundwater levels are particularly high due to being just downstream of the confluence of the Salinas River and Arroyo Seco River. Therefore, no overdraft is expected in the near future, supported by the recently projected sustainable yield estimated for the Forebay Subarea.

Projected sustainable yield is the long-term pumping that can be sustained once all undesirable results have been addressed. Based on the success of proposed projects and management

[1] Firm capacity is total capacity with the largest single unit offline. (Soledad 2019 Water System Master Plan, Section 2.3).

actions, there may be some years when pumping must be held at a lower level to achieve necessary rises in groundwater elevation. The actual amount of allowable pumping from the subbasin will be adjusted in the future based on the success of projects and management actions.

To retain consistency with the historical sustainable yield, projected sustainable yield can be estimated by summing the average annual groundwater extractions and adjusting by the average change in storage. This represents the change in pumping that results in no change in storage, assuming no other projects or management actions are implemented. Chapter 6 of the Salinas Valley: Forebay Aquifer Subbasin GSP (Draft, March 2021, Table 6-20) shows projected sustainable yield estimates. These results indicate that the projected future sustainable yield is larger than the projected future groundwater pumping. The general conclusion is that the Forebay Aquifer Subbasin can be managed within its sustainable yield in the future. The sustainable yield value will be updated in future GSP updates as more data is collected and additional analyses are conducted.

7.1.2 RECYCLED WATER

Recycled water has proven to be an effective “drought-resilient” supply of local water that the City is currently developing. The City will directly produce, store, and distribute recycled water for landscape irrigation, ball fields, and open spaces. The use of recycled water will offset the use of potable groundwater supplies.

7.1.3 CONSTRAINTS ON WATER SOURCES

Several factors that could potentially disrupt the City’s groundwater supply include earthquakes, water quality impacts, regulatory changes, and other emergency supply shortage conditions. The City’s response to these potential supply disruptions are discussed in the City’s Emergency Operations Plan (EOP). The City’s EOP is discussed in more detail in Chapter 8. There are no potential legal factors that could impact the City’s access to a reliable water supply.

7.1.3.1 CLIMATE CHANGE AND GROUNDWATER STORAGE

Changes in climate can affect water supply and water quality through modifications in the timing, amount, and form of precipitation. The seasonal variability of water demand and evapotranspiration (ETo) is projected to increase with climate change as droughts become more common and more severe. Changing climate patterns are expected to alter precipitation patterns and affect water supply availability, as discussed in Sections 3.3 and 6.8.1. Unpredictable weather patterns will make water supply planning more challenging.

Surface water sources are more vulnerable to drought events. Because the City can fully rely on groundwater, it is somewhat less susceptible to drought impacts. However, surface waters recharge the aquifers; thus, the City could be vulnerable to a particularly severe and prolonged drought.

The Greater Monterey County IRWM Plan identifies areas of concern related to water supply and quality in California that climate change and prolonged drought periods will impact, including the following:

- Reduction in Sierra Nevada Mountain snowpack.
- Anticipated changes in rain patterns and intensity adding to the uncertainty of water supply and to creek instability.
- Potential impacts from sea-level rise and storm surges on coastal aquatic resources and water infrastructure.
- Exacerbation in saltwater intrusion in groundwater basins from sea-level rise.
- Anticipate increase in number and severity of wildfire events, with subsequent erosion and water quality problems.
- Potential increase in flooding.
- Water supply problems associated with water quality impairments, particularly with nitrates and seawater intrusion.
- Problems with water storage and conveyance infrastructure (inadequate, leaky, or otherwise defective water systems).
- Overconsumption/overdraft, specifically for irrigation and municipal supplies, including landscaping.
- Unreliable water supply in certain areas, particularly in small communities.

Other important issues of concern due to global climate change include the following:

- Changes in urban and agricultural demand levels and patterns.
- Increased evapotranspiration from higher temperatures.
- Impacts to human health from water-borne pathogens and water quality degradation.
- Declines in ecosystem health and function.
- Alterations to power generation and pumping regime.

The IRWM Plan further identifies the following needs to offset climate change impacts:

- Need for increased water conservation, including gray water reuse and rainwater catchment.
- Increased environmental water needs, including fisheries and wildlife.
- Need for greater drought management.
- Need for increased public education about water supply issues.

An emphasis on storage is needed in California to offset impacts from risks and uncertainties from a variety of sources, including water quality, climate change, regulatory and operational changes, project construction and implementation issues, infrastructure reliability and maintenance, and demographic and growth uncertainty.

Any of these risks and uncertainties, should they occur individually or collectively, may result in a negative impact to water supply reliability. While it is impossible to know how much risk and uncertainty to guard against, the region's reliability will be more secure with a long-term plan that recognizes risk and provides resource development to offset that risk.

The Salinas Valley Groundwater Basin GSP Water Supply Vulnerability Assessment estimates that groundwater storage losses due to seawater intrusion would range from 8,000 to 14,000 AFY. However, the Forebay Aquifer Subbasin Groundwater Budget for projected climate change shows a 10,000 AF net storage gain in 2030 and a 9,700 AF net storage gain in 2070 (Chapter 6, Table 6-10). These gains consider groundwater pumping, net stream exchange, deep percolation, net flows between subbasins, and groundwater ETo, ultimately resulting in an increase in sustainable yield for the same years, 2030 and 2070, of nine percent and eight percent, respectively.

In 1991, the final year of a three-year drought, the groundwater table dropped between 90 and 100 feet in the areas near the coast; drawdown in the Forebay Aquifer Subarea was generally limited to 15 to 20 feet. In 2016, the fourth year of the 2012–2017 drought, the Forebay Subarea dropped nearly 33 feet. Because very little rainfall occurs in the summer months, the groundwater table is generally 10 feet lower during the summer than during the winter. Regardless, Soledad's water supply has not proven vulnerable to seasonal changes.

7.1.3.2 WATER QUALITY OF GROUNDWATER

As discussed in Section 6.2.2.5, nitrate contamination is the most significant nutrient affecting groundwater quality in the lower Salinas River watershed. Levels of nitrate in groundwater that exceed the MCL pose a threat to human health and to other biological organisms that depend on groundwater. Nitrate contamination in the Salinas Valley is due primarily to the use of nitrogen-based synthetic fertilizers for irrigated agriculture and commonly occurs in the unconfined and semi-confined aquifers that underlie areas of intense agricultural activity. However, nitrate contamination can also be caused from septic system failures, wastewater treatment ponds located in floodplains that convey sewage during flood events, and livestock waste.

Nitrate contamination is present throughout the Salinas Valley in varying concentrations. In 2010, MCWRA reported that the Forebay Subarea had 41 wells sampled. At that time, the percentage of wells greater than the MCL was 54 percent.[2] The MCWRA has documented increasing trends of nitrate levels in the Salinas Valley Groundwater Basin between 1993 and 2007. All of the Salinas Valley cities, including Soledad, have had to replace domestic water wells due to high nitrate levels that exceeded the drinking water standard.

7.1.3.3 WATER QUALITY OF RECYCLED WATER

Recycled water has higher total dissolved solids (TDS) than groundwater as a function of the water treatment process. The higher concentration of salts in recycled water can have negative impacts to sensitive plants or landscapes suffering multiple year droughts that do not receive natural rainfall to flush salts down past the root zone. The City is monitoring development of the

[2] Technical Memorandum from MCWRA to EPA Region IX, dated July 30, 2010 (MCWRA 2010a) (Greater Monterey County IRWM Plan, Section B, Table B-20).

2018 water conservation legislation (AB 1668/SB 606) that may have the effect of diminishing indoor water use, thereby reducing wastewater volumes. This may have the deleterious effect of increasing TDS concentrations, which may have costly impacts to the end-users (replacement of landscaping) or the City (enhanced treatment).

7.1.3.4 EMERGENCY SUPPLY SHORTAGES

In the event of an emergency supply shortage, the City would rely on its Water Shortage Contingency Plan (Chapter 8 and Appendix I) and its Emergency Operations Plan to guide the City's response and actions.

Specifically, if a major earthquake on the San Andreas Fault occurs, it may be damaging to the regions' water systems and disrupt groundwater supplies for a period of time. The region may impose a water use reduction ranging from 10 to 25 percent until the system is repaired.

7.1.4 RELIABILITY BY TYPE OF YEAR

In California, water supply reliability is largely driven by hydrologic conditions. The UWMP water supply reliability assessment requires a water supplier to define its available water supply into three hydrologic year types: (1) normal supply, (2) single-dry year supply, and (3) multiple-dry five-year supply.

The average (normal) hydrologic condition for the City's service area is represented by the year 1985. The City's base year for a single dry year is 1991 and for five consecutive dry years is 1989–1993 for its water supply reliability assessment. The City's recycled water supply, once in use, will be 100 percent reliable during all hydrologic year types, based on prevalent analysis of recycled water supplies.

This section discusses the type of years considered when evaluating water supply reliability. The conditions are as follows:

- **Average Water Year** – The average water year is a year that represents the median runoff levels from precipitation, as well as the same general pattern of runoff. The supply quantities would be similar to historical average supplies.
- **Single Dry Year** – The single dry year is defined as the individual year with the lowest usable water supply. This condition can be derived as the year with the lowest annual supply. For the City, 1991 was selected to represent the single dry year.
- **Multiple Dry Years** – Multiple dry years are defined as the five consecutive years with the lowest usable water supply. The multiple dry years are detrimental to the water supply system because of their adverse effect on the levels of local and statewide reservoirs, as well as groundwater levels. Available supply for these conditions is constituted as the minimum historical yields for a running average of five years. For the City, the period between 1989 and 1993 was selected to represent the multiple dry years.

Consistent with the City's 2010 and 2015 UWMPs, average, single-dry, and multiple-dry year periods were determined based on rainfall data available from DWR.

Table 7-1 shows the basis of water year data used to predict drought supply availability.

TABLE 7-1: BASIS OF WATER YEAR DATA (RELIABILITY ASSESSMENT)

YEAR TYPE	BASE YEAR	PERCENT OF AVERAGE SUPPLY (%)
Average Year	1985	100%
Single-Dry Year	1991	100%
Consecutive Dry Years 1st Year	1989	100%
Consecutive Dry Years 2nd Year	1990	100%
Consecutive Dry Years 3rd Year	1991	100%
Consecutive Dry Years 4th Year	1992	100%
Consecutive Dry Years 5th Year	1993	100%

The following sections provide water supply and demand projections from 2025 to 2045 for normal, single dry, and multiple dry years (five consecutive years). Projections include both potable and recycled water supplies combined for results in this section.

7.1.5 WATER SERVICE RELIABILITY – NORMAL YEAR, SINGLE DRY, AND FIVE CONSECUTIVE DRY YEARS

As summarized above, the Forebay Aquifer Subbasin is characterized by general stability, and even during multiple dry years, the groundwater table was marginally lower.

The annual sustainable yield of the Forebay Aquifer Subbasin is estimated to be 148,000 afy. The City's sustainable groundwater yield exceeds projected demands during average, single-dry, and five consecutive dry water year periods. Therefore, the City's water supply is 100 percent reliable in all hydrologic conditions.

Table 7-2 shows normal year supply and demand comparisons for potable and recycled water through the year 2045.

TABLE 7-2: NORMAL YEAR SUPPLY AND DEMAND COMPARISON (AF)

	2025	2030	2035	2040	2045
Supply Totals	148,049	148,055	148,065	148,070	148,080
Demand Totals	2,407	2,460	2,774	3,083	3,703
Difference	145,642	145,595	145,291	144,987	144,377

Table 7-3 shows single dry year supply and demand comparisons for potable water and recycled water through 2045. For the single dry year, a four percent increase has been applied to normal demands, consistent with the estimated increase in demand that the City experienced in 2012, the first year of the most recent five-year drought (2012–2016). Subsequently, the City experienced a significant drop in demand by 2015, assumed to result from customer conservation measures.

TABLE 7-3: SINGLE-DRY YEAR SUPPLY AND DEMAND COMPARISON (AF)

	2025	2030	2035	2040	2045
Supply Totals	148,049	148,055	148,065	148,070	148,080
Demand Totals	2,503	2,558	2,885	3,206	3,851
Difference	145,546	145,497	145,180	144,864	144,229

Multiple dry years are defined as five consecutive year drought periods. As stated above, the City's sustainable groundwater yield exceeds projected demands during average, single-dry, and five consecutive dry year periods. Therefore, the City's water supply is 100 percent reliable in multiple-dry year conditions through 2045.

For projected potable demand, the drought experience of 2012–2016 informs multiple-dry year demand year-over-year changes. The single-dry year scenario used in Table 7-3 of a four percent increase in demand is used again for the first year in this scenario. The subsequent years used a five percent annual decrease in demand. While the City experienced an actual decrease of between eight and nine percent in demand during the subsequent years of the 2012–2016 drought, to create a conservative water reliability assessment, demand decrease was held at five percent per year. Table 7-4 provides the five consecutive dry year supply and demand projections through 2045.

TABLE 7-4: MULTIPLE DRY YEARS SUPPLY AND DEMAND COMPARISON (AF)

		2025	2030	2035	2040	2045
First Year	Supply Totals	148,049	148,055	148,065	148,070	148,080
	Demand Totals	2,407	2,460	2,774	3,083	3,703
	Difference	145,642	145,595	145,291	144,987	144,377
Second Year	Supply Totals	148,049	148,055	148,065	148,070	148,080
	Demand Totals	2,384	2,436	2,748	3,053	3,668
	Difference	145,665	145,619	145,317	145,017	144,412
Third Year	Supply Totals	148,049	148,055	148,065	148,070	148,080
	Demand Totals	2,270	2,320	2,617	2,908	3,493
	Difference	145,779	145,735	145,448	145,162	144,587
Fourth Year	Supply Totals	148,049	148,055	148,065	148,070	148,080
	Demand Totals	2,162	2,210	2,492	2,769	3,327
	Difference	145,887	145,845	145,573	145,301	144,753
Fifth Year	Supply Totals	148,049	148,055	148,065	148,070	148,080
	Demand Totals	2,059	2,104	2,373	2,638	3,168
	Difference	145,990	145,951	145,692	145,432	144,912

7.1.6 DESCRIPTION OF MANAGEMENT TOOLS AND OPTIONS

The City is committed to developing locally reliable potable and non-potable supplies to meet the City's future demands (see Table 6-7 Future Water Supply Projects and Programs). The City is strategically upgrading wells to ensure supply reliability, construction of new wells for future developments to ensure supply sufficiency, and development of its recycled water distribution system. Projects to increased groundwater reliability and capacity are important to the City, as well as continuing to implement effective and innovative demand management measures (Chapter 9).

While the City's water service reliability assessments conclude that the City can meet 100 percent of projected demands in all hydrologic scenarios, the intent is to show the City is reasonably prepared for the unexpected. To that extent, the City has developed a comprehensive Water Shortage Contingency Plan (Chapter 8 and Appendix I) that lays out a framework for how the City can best manage water supply shortages.

7.2 DROUGHT RISK ASSESSMENT

Every urban water supplier is required to include a Drought Risk Assessment (DRA) as part of its 2020 UWMP. The CWC requires that a DRA be based on the driest five-year historical sequence for the supplier while also considering plausible changes to projected water supply and demand due to climate change or regulatory changes. Specifically, a DRA evaluates whether a water shortage condition due to extended drought is expected to occur over the next five consecutive years (2021 to 2025). This DRA is designed to work in conjunction with the Water Service Reliability Assessment (Section 7.1) and Water Shortage Contingency Plan (Chapter 8 and Appendix I) to present a comprehensive view of the City's water reliability, preparedness, and water shortage response actions for drought.

7.2.1 DATA, METHODS, AND BASIS FOR WATER SHORTAGE CONDITION

The City's DRA is conducted using the same methodology as the multiple dry year analysis in the Water Service Reliability Assessment in Section 7.1.3 for the potable and non-potable water systems. For the purposes of this UWMP narrative, the DRA is shown for only the potable water system since non-potable supplies cannot supplement potable water in emergencies, and they are 100 percent reliable in drought scenarios, although vulnerable to emergencies, such as earthquakes and power outages. However, as is required when submitting the requisite UWMP standardized tables to DWR, a combined DRA of both water systems is provided and included in Appendix M.

7.2.1.1 POTABLE WATER

The five driest hydrologic years selected to define the DRA are the years 1989–1993. The 1989–1993 dry hydrologic conditions were applied to years 2021–2025 to assess chronic dry year supplies available to the City. The City's experience from the most recent consecutive five-year drought period of 2012–2016 informs how demands are forecasted for this DRA. The City's unconstrained potable water demand from 2020 (2,264 AF) is used as a baseline to project multiple dry year demands for 2021 through 2025. The potable water demand percentage increases used in the water service reliability for multiple dry years analysis were again used in this DRA. Year 1 (2021) demand increases by four percent, while subsequent years decrease by five percent each year. Demands in the latter four years decline because of regional and statewide drought messaging, which helps to suppress demand at the local level.

7.2.2 DRA WATER SOURCE RELIABILITY

The City's potable water service reliability for near-term drought conditions is 100 percent. Shown in the Reliability Assessment, the City's sustainable groundwater yield exceeds projected demands during average, single-dry, and five consecutive dry water year periods. Therefore, the City's available water supply over the next five years if a drought persists is projected to exceed expected demands.

7.2.3 TOTAL WATER SUPPLY AND USE COMPARISON

The City's potable water service reliability is 100 percent in all years during a hypothetical consecutive five-year drought. This is attributable to the anticipated available groundwater supply, which exceeds the City's projected demands. This water supply surplus is from a well-managed basin largely driven by the actions of the MCWRA working collaboratively with overlying agencies to maximize the development and reliability of groundwater supplies. In addition, the City has been proactive with respect to improving and developing its water supply system and continues to construct new wells in advance of demand.

While the DRA does not indicate as such, the City would still maintain and refine its water use efficiency program offerings to its customers to manage demand in future years, regardless of the hydrologic scenario.

Table 7-5 demonstrates the City's potable water service reliability of 100 percent in a near-term drought scenario that extends from 2021 through 2025.

TABLE 7-5: FIVE-YEAR DROUGHT RISK ASSESSMENT – POTABLE (AF)

2021	Total AF
Gross Water Use	2,209
Total Supplies	148,000
Surplus/Shortall without WSCP Action	145,791
Planned WSCP Actions – supply augmentation benefit	
Planned WSCP Action – use reduction savings benefit	
Revised Surplus/Shortfall	145,791
Resulting % Use Reduction from WSCP Action	0%
2022	**Total AF**
Gross Water Use	2,083
Total Supplies	148,000
Surplus/Shortall without WSCP Action	145,917
Planned WSCP Actions – supply augmentation benefit	
Planned WSCP Action – use reduction savings benefit	
Revised Surplus/Shortfall	145,917
Resulting % Use Reduction from WSCP Action	0%
2023	**Total AF**
Gross Water Use	2,176
Total Supplies	148,000
Surplus/Shortall without WSCP Action	145,824
Planned WSCP Actions – supply augmentation benefit	
Planned WSCP Action – use reduction savings benefit	
Revised Surplus/Shortfall	145,824
Resulting % Use Reduction from WSCP Action	0%
2024	**Total AF**
Gross Water Use	2,229
Total Supplies	148,000
Surplus/Shortall without WSCP Action	145,771
Planned WSCP Actions – supply augmentation benefit	
Planned WSCP Action – use reduction savings benefit	
Revised Surplus/Shortfall	145,771
Resulting % Use Reduction from WSCP Action	0%
2025	**Total AF**
Gross Water Use	2,247
Total Supplies	148,000
Surplus/Shortall without WSCP Action	145,753
Planned WSCP Actions – supply augmentation benefit	
Planned WSCP Action – use reduction savings benefit	
Revised Surplus/Shortfall	145,753
Resulting % Use Reduction from WSCP Action	0%

7.2.3.1 NON-POTABLE (RECYCLED) WATER

The City's recycled water service will be 100 percent reliable in all years during a hypothetical consecutive five-year drought. This is attributable to the City's current investments in production capacity of recycled water at the City's Water Reclamation Plant and operational flexibility.

8 WATER SHORTAGE CONTINGENCY PLAN

The City is responsible for conserving the available water supply, protecting the integrity of water supply facilities (infrastructure), and implementing a contingency plan in times of drought, supply reductions, failure of water distribution systems, or emergencies. Particular emphasis is placed on use of domestic (potable) water, sanitation, fire protection, and preservation of public health, welfare, and safety, in addition minimization of the adverse impacts of water supply shortage or other water supply emergency conditions that do not include recycled water.

The City has updated its Water Shortage Contingency Plan (WSCP/WSC Plan) in accordance with CWC Section 10632, which is part of the Urban Water Management Planning Act regulatory requirements. A copy of the WSC Plan is in Appendix I.

In 2018, as a response to California's drought of 2012–2016 and some urban water suppliers experiencing water reliability challenges, the State Legislature updated Section 10632, as a result of Senate Bill 606, to require that all urban water suppliers develop and adopt a WSC Plan as part of the 2020 UWMP. Water Code Section 10632 now requires several prescriptive elements that suppliers must address. These requirements are listed below in Section 8.1.

The WSC Plan provides the strategic responses the City may take if a water shortage is declared to conserve and manage precious water resources that are essential to maintain public health and community vitality. While the WSC Plan is included as an appendix to this 2020 UWMP as required by the Water Code, the WSC Plan is a separate document from the City's 2020 UWMP and can be amended, as needed, without amending the 2020 UWMP.

The WSC Plan supports and builds on the City's Mandatory Water Conservation Regulations (Chapter 13.09, City of Soledad Municipal Code, Ordinance 534, 1993, Appendix D) to meet the CWC requirements. The WSC Plan and the Mandatory Water Conservation Regulations will be informed and enacted through the annual water supply and demand assessment.

Additionally, the City's Water Shortages and Service Interruptions (Chapter 13.08.030, City of Soledad Municipal Code, Appendix D) declares, "A. The City shall exercise reasonable diligence to provide continuous and adequate water service to consumers and to avoid any shortage or interruption of delivery of water; provided, that the City may suspend water service temporarily to make necessary repairs and improvements to the municipal water system." It also states, "B. During any period of threatened or actual water shortage, the City may apportion its available water among consumers in such manner as appears most equitable under the circumstances then prevailing and with due regard to public health and safety."

The City's WSC Plan also builds on the lessons learned in successfully meeting the challenges of the most recent drought (2012–2017). While the UWMP functions as a long-term planning document, the WSC Plan serves as a short-term planning tool designed to be utilized on an annual basis to determine if there will be a water shortage and, if so, what actions will be taken to remedy the shortage.

The City works with the community to implement the requirements of the WSC Plan to result in conserved water resources during times of drought and water shortages. Equally, the City works in partnership with the Monterey County Water Resources Agency and other water agency partners to ensure regional water reliability.

8.1 OVERVIEW OF THE WATER SHORTAGE CONTINGENCY PLAN

The WSC Plan serves as the operating plan that the City will use to prevent catastrophic water service disruptions through proactive, rather than reactive, mitigation of water shortages. The WSC Plan includes the processes and procedures that will be deployed when shortage conditions arise. These procedures set the foundation for the City Council, City management, and staff to easily identify and efficiently implement pre-determined steps to mitigate a water shortage to the level appropriate to the degree of water shortage anticipated.

The WSC Plan's purpose is to provide a plan of action to be followed at the various levels of a water shortage to balance demand with constrained supplies. The WSC Plan includes the steps to assess if a water shortage is occurring and what level of demand reduction actions to trigger the most appropriate response to the water shortage conditions. The WSC Plan outlines the shortage response actions that will be implemented, as discussed in Section 8.3 below.

The WSC Plan's prescriptive elements include the following:

- Water Supply Reliability Analysis
- Annual Water Supply and Demand Assessment Procedures
- Water Shortage Levels
- Shortage Response Actions
- Seismic Risk Assessment
- Communication Protocols
- Compliance and Enforcement
- Legal Authorities
- Financial Consequences of WSC Plan Activation
- Monitoring and Reporting
- WSC Plan Refinement Procedures
- Special Water Feature Distinction
- Plan Adoption, Submittal, and Availability

8.2 SUMMARY OF WATER SHORTAGE RESPONSE STRATEGY

The WSC Plan is organized into 12 sections in compliance with the CWC Section 16032 requirements.

Section 1: Overview and Intention – This section includes an introduction and overview of the WSC Plan, the WSC Plan's purpose and principles, how it builds on the City's Municipal Code on Mandatory Water Conservation Regulations, how it meets the requirements of the CWC, and coordination with regional water management groups.

Section 2: Water Supply Reliability Analysis and Annual Assessment Process – The CWC requires two analyses to be conducted on a regular basis to evaluate supply reliability: a Water Supply Reliability Assessment and a Drought Risk Assessment. This section details how the City will perform these analyses along with regional partners.

Section 3: Water Supply Shortage Levels – One of the major changes to the WSC Plan was requiring water suppliers to standardize shortage levels into six levels corresponding to progressive ranges of up to 10, 20, 30, 40, 50, and more than 50 percent shortages. The water shortage levels and the triggering mechanisms (supply conditions) to determine the appropriate shortage level are presented.

Section 4: Water Shortage Response Actions – This section details the permanent water conservation best management practices that the City promotes for customers, operational best practices utilized by the City, and required shortage response actions at each water shortage level. This section also presents the process for declaring an emergency or catastrophic water supply shortage, establishing the necessary and appropriate conservation actions, and initiating or terminating a water shortage level. The procedure for requesting a variance is also presented, along with a copy of the variance form, in the WSC Plan (Appendix I).

Section 5: Communication Protocols – In the event of a water shortage, timely and effective communication is a critical element. This section details the communication protocols and procedures in place to inform the community of any current or predicted shortages, along with required actions. Topics discussed include coordination; key audience, stakeholders, and partners; customer outreach and engagement tools; communication objectives; communication protocol for declaring a water shortage; communication strategies for water shortage levels; and crisis communication.

Section 6: Local Hazard Mitigation Plan and Seismic Risk Assessment – The Monterey County Multi-Jurisdiction Local Hazard Mitigation Plan is presented with a focus on a seismic risk assessment and mitigation plan to assess the vulnerability of each of the various facilities of the City's water system and to mitigate those vulnerabilities. This section also includes planning and mitigation for catastrophic supply interruption and coordination with the City's Emergency Operations Plan.

Section 7: Compliance and Enforcement – Since the CWC requires water suppliers to penalize excessive use, this section details the methods of enforcement available to the City. This includes warnings, penalties, and variances, as well as exclusively applying enforcement revenues to City water conservation programs.

Section 8: Legal Authorities – This section describes the legal authority that the City has to implement and enforce its WSC Plan. Specifically, the California Constitution Article X – Water Section 2 and CWC Section 100 view that conservation should be exercised toward the reasonable and beneficial use in the interest of the people and public welfare. In addition, City Ordinance 534, Mandatory Water Conservation, prohibits the waste of water and imposes water conservation requirements on customers.

Section 9: Financial Impacts – The City's volume-based rate structure is designed and intended to be an ongoing and active water demand management tool that proportionately recovers the cost of providing water service within the City's service area. This section reviews the impacts that consumption reduction will have on the revenues and expenditures of the City. Specifically explained are the City's rate structure and billing process, the impact on the Water Enterprise fund, the temporary use of the City's water reserves to manage rate volatility, and the possibility of temporary rate increases for long-term drought conditions.

Section 10: Monitoring, Reporting, and Refinement – To perform accurate assessments, accurate data is required. This section details how the City will monitor pertinent water supply data under normal monitoring procedures and under each water shortage level and how the City will perform the requisite analyses to determine if the shortage response actions are effective. Procedures to refine the WSC Plan are presented.

Section 11: Special Water Feature Distinction – The CWC requires suppliers to define any regulations covering special water features that are artificially supplied with water, such as ponds, fountains, and lakes, separately from swimming pools and spas. This section defines Decorative Water Features and Recreational Water Features and the restrictions for each.

Section 12: WSC Plan Adoption, Submittal, and Availability – This section establishes the procedures for the City to adopt and submit the WSC Plan to DWR, the California State Library, and the County of Monterey and how it will be available to the public.

8.3 WATER SHORTAGE CONTINGENCY PLAN LEVELS

The WSC Plan outlines the shortage response actions (WSC Plan Section 4.3.7) that will be implemented by the City in the event of water supply shortages due to catastrophic events, drought, etc. The WSC Plan's purpose is to provide a plan of action to be followed at the various levels of a water shortage in order to balance demand with constrained supplies.

The WSC Plan is based on detailed demand reduction measures that are structured to match varying levels of water shortage. This will help the City's water customers understand what to expect during a water shortage situation.

The City does not anticipate development of supply augmentation actions given that it is 100 percent dependent on a reliable source of groundwater and recycled water is still being developed. Supply augmentations represent short-term management objectives triggered by the WSC Plan and do not overlap with the long-term new water supply development or supply reliability enhancement projects. The groundwater supply available to the City in all levels of water shortage is anticipated to satisfy the demands of the City's customers even if demand reduction actions were limited.

The shortage response actions/demand reduction actions that align with each shortage level are described in Table 8-1. In the WSC Plan, Table 4-6, Shortage Response Actions and Shortage Gap Reductions, also estimates the extent to which each action will reduce the gap between supplies and demands. This demonstrates that choosing a suite of shortage response actions can be expected to deliver the outcomes necessary to meet the requirements of a given shortage level.

TABLE 8-1: RETAIL: WATER SHORTAGE CONTINGENCY PLAN LEVELS

SHORTAGE LEVEL	PERCENT SHORTAGE RANGE	SHORTAGE RESPONSE ACTIONS
1	Up to 10%	• Increase public awareness • Encourage voluntary outdoor water use efficiency • Encourage diligent repair of water leaks within 72 hours • Reinforce permanent water conservation BMPs
2	Up to 20%	• Shortage Level 1 response actions remain in effect • Voluntary reduction of up to 25%
3	Up to 30%	• Shortage Levels 1 and 2 response actions remain in effect • Irrigation limits to watering days: Existing Landscapes – 2 days/week; New Landscapes – for adequate growth up to 5 weeks • Golf Courses/Athletic Fields: Out-of-play areas 2 days/week; in-play area only before 10 a.m. or after 5 p.m. to implement 10% reduction in irrigation water use • Hotels, motels, and B&Bs offer limited linen/towel exchange • Swimming pools/spas: Initial filling prohibited; draining/refilling permitted only if repair needed; must be covered • Industrial/commercial water use reduction encouraged; compliance with outdoor water use required; use from unmetered fire hydrants prohibited, except by City personnel • Non-commercial washing of vehicles and mobile equipment permitted on assigned landscape watering days • Use of potable water for dust control reduced as possible
4	Up to 40%	• Shortage Levels 1, 2, and 3 response actions remain in effect or are revised • Irrigation limits to watering days: Existing Landscapes – 1 day/week; New Landscapes – 3 days/week for 5 weeks, then 1 day/week • Golf Courses/Athletic Fields: Out-of-play areas 1 day/week; in-play area only before 10 a.m. or after 5 p.m. to implement 20% reduction in irrigation water use • Hotels, motels, and B&Bs limit linen/towel exchange to once every 2 nights or for entire stay, whichever is shorter • Swimming pools/spas: Initial filling prohibited; draining/refilling permitted only if a pool component has become hazardous; must be covered to avoid evaporation • Non-commercial washing of vehicles and mobile equipment permitted on assigned landscape watering days only during landscape watering hours; fleet managers encouraged to only wash vehicles as necessary for health and safety • Reduction of water use by any means encouraged • City Council may establish mandatory use reduction targets, if needed

TABLE 8-1: RETAIL: WATER SHORTAGE CONTINGENCY PLAN LEVELS

SHORTAGE LEVEL	PERCENT SHORTAGE RANGE	SHORTAGE RESPONSE ACTIONS
5	Up to 50%	• Shortage Levels 1, 2, 3, and 4 response actions remain in effect or are revised • Landscape watering with potable water is prohibited except for new landscape, then 2 days/week for 5 weeks • Golf Courses/Athletic Fields: Out-of-play areas watering prohibited; in-play area only before 10 a.m. or after 5 p.m. to implement 30% reduction in irrigation water use • Hotels, motels, and B&Bs limit linen/towel exchange to once every 3 nights or for entire stay, whichever is shorter • Swimming pools/spas: All filling and draining/refilling prohibited; must be covered to avoid evaporation • Non-commercial washing of vehicles and mobile equipment is prohibited; only commercial facilities with water recycling systems permitted • Industrial/commercial water use reduction encouraged; City Council may establish mandatory use reduction targets; compliance with outdoor water use required; use from unmetered fire hydrants prohibited, except by City personnel • City Council may establish mandatory construction water budgets
6	>50%	• Shortage Levels 1, 2, 3, 4, and 5 response actions remain in effect or are revised • Emergency Public Outreach • Elimination of all turf irrigation with potable supplies; restrict watering to shrubs and trees by hand or drip irrigation only • Shut-off of dedicated landscape irrigation meters • Elimination of water served in food service establishments unless requested • Elimination of the issuance of construction meters • Moratorium on provision of new supply meters • Other mandatory restrictions and enforcement, as necessary

9 DEMAND MANAGEMENT MEASURES

California Water Code Section 10631(e)(1) requires that the UWMP provide a description of the supplier's water demand management measures (DMMs) that are used to achieve water use targets. This chapter provides a description of Soledad's DMMs and their effectiveness.

Demand management is an integral part of sustainably managing water resources in California. A growing population typically increases the demand for water. Without mitigation, increased water demand, coupled with reduced supplies or shifts in supplies related to climate change and other factors, can jeopardize water reliability. DMMs are important mitigation measures that reduce demand, improve water service reliability, and help meet state and regional water conservation goals. Reducing demand can also benefit the City through reduced energy costs.

9.1 EXISTING AND PLANNED DEMAND MANAGEMENT MEASURES

9.1.1 WATER WASTE PREVENTION ORDINANCES

Relevant water waste prevention ordinances include the Mandatory Water Conservation Regulations, building code requirements, and recently updated Water Shortage Contingency Plan.

In 1993, the City established Mandatory Water Conservation Regulations (Appendix D), which are in effect at all times. The City enforces these mandatory water use prohibitions through the issuance of warnings and penalties.

The City's building code requires developers to install water-efficient landscaping for new construction and rehabilitated landscapes where a permit, plan check, or design review is required. Landscaping must meet or exceed the State of California's Model Water Efficient Landscape Ordinance (MWELO). Projects are required to comply with the state's MWELO through the City's Planning Department. Plans are checked during plan review, and projects are inspected during construction by the Building Department. Calculations required by the MWELO must be signed and certified by a "MWELO certified" professional, such as a landscape designer.

The City established additional water waste prevention measures for use during times of drought. These measures are included in the Water Shortage Contingency Plan (Appendix I). As summarized in Chapter 8, these additional prohibitions will enable the City to reduce demand during varying levels of water supply shortage.

9.1.2 METERING

The City installed Neptune meters on all connections except fire service. The Neptune system provides monthly readings. City staff manually read the meters monthly. The Neptune system flags users with significant usage increases. Where there is high usage, the billing system automatically requests a re-read of the meter.

The City reviews flagged accounts to determine if a leak is the possible source of the water usage increase. The City contacts the resident to communicate the likelihood of a probable leak and then works with the resident to determine the location of the leak and to initiate repair measures. The City estimates that it visited residents about 14 times per month in 2020; 99 percent of the time the resident had a leak of some kind.

In addition, the City is now transitioning to Badger Meters, which allow for remote meter reading and provide superior graphics that help detect leaks/abnormally high usage in real time and allow faster resolution of issues. In spite of a temporary halt to new meter installs during the initial stages of the COVID-19 pandemic, the City completed installation of 256 Badger Meters in 2020. The City will continue to install approximately 300 new Badger Meters per year, completing installations across the service area in 10 years.

The new Badger Meters can graph water use over a 12-hour period. When residents with a Badger Meter call to inquire about a large water bill, the City can determine the probability of a water leak without the need to send staff to the residence. This has been particularly useful during COVID-19 pandemic restrictions.

9.1.3 CONSERVATION PRICING

Water billing rates encourage water conservation through a tiered rate structure. There is a flat rate based on meter size and a volume-based rate. The volume-based rate incorporates higher rates for higher usage tiers.

All City water service connections are charged monthly for the volume of water used. The City's current water rate schedule provides separate water rates for single-family residential, multi-family residential, commercial, school, and public account types. Each account type is charged at a specific rate for every hundred cubic feet (hcf) of water used monthly.

The single-family residential account type is further broken down into three usage tiers based on the amount of water consumed, as follows:

- Tier 1: 0 to 7 hcf
- Tier 2: 7.01 to 23 hcf
- Tier 3: Greater than 23 hcf

The first 7 hcf used is charged at the lowest rate. The next tier, 7.01–23 hcf, is charged at a higher rate. If the household uses more than 23 hcf, that usage is charged at the highest rate. The tiered structure communicates the value of water, provides financial incentives to conserve water, and reimburses the utility for the cost of maintaining a safe drinking water program with sufficient capacity to meet the needs of the city.

9.1.4 PUBLIC EDUCATION AND OUTREACH

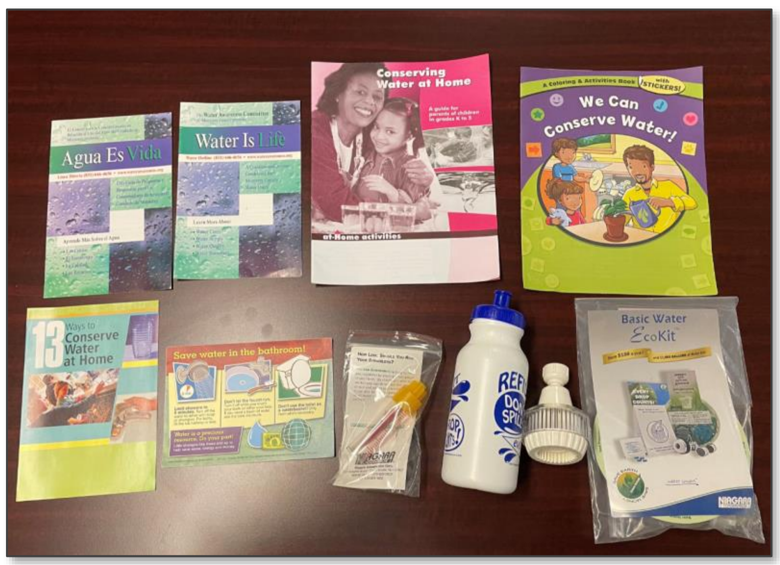
The City has undertaken multiple public information programs to help reduce water consumption and to raise public awareness of methods of water conservation, as well as incentivize replacement of high water use fixtures through both optional and mandated fixture replacement programs.

To raise awareness of water conservation, the City broadcasts water use information to the public through a variety of methods. The City:

- Maintains a page on its website with links on conservation measures and tips for conserving water.
- Initiates direct mailing of information on water conservation measures to all citizens during drought conditions.
- Provides notices in monthly utility bills, such as "We need your help to conserve," "Fix toilet leaks & save water," "Install low flow devices," and "Fix dripping water/shower faucets."
- Distributes door hangers that educate homeowners on the current water situation and provide tips on how members of the community can reduce flow to the wastewater treatment facility.

The City is a member agency of waterawareness.org. This agency provides a number of benefits, including a Water Awareness Kit with a sprinkler rain gauge, low-flow showerhead, aerator, water bottle, coloring books and stickers for children, and educational water conservation brochures (Figure 9-1).

FIGURE 9-1: WATERAWARENESS.COM KIT CONTENTS



Waterawareness.org also provides classroom conservation and pollution prevention presentations designed specifically for each grade level. In 2021, the City will hire a new Community Engagement Manager. The new Community Engagement Manager will work to enhance classroom and community education for water conservation education and stormwater management.

9.1.5 PROGRAMS TO ASSESS AND MANAGE DISTRIBUTION SYSTEM REAL LOSS

The City performs leak detection to identify water losses, whether on private property or in City-owned pipes.

The City's Public Works Department is responsible for handling and scheduling all water system audits and repairs. Under the City's capital improvement plan, the Department is replacing aging water valves and older, one-inch water lines that currently serve two homes (each home will have a dedicated line). Water mains are replaced as breaks are reported.

When a leak is suspected, the City uses a Rigid Underground Utility Locator to determine the location and direction of the pipe. A water leak sounder then helps pinpoint the actual leak, with 90 percent accuracy.

The City's Public Works Department also performs an annual hydrant-flushing program. As part of this program, the City assesses the hydrant and the pipe to the hydrant for leaks.

Water losses are tracked and reported, as previously discussed in Chapter 4. Since 2016, water losses have remained below 10 percent (7.9 percent in 2020).

9.1.6 WATER CONSERVATION PROGRAM COORDINATION AND STAFFING SUPPORT

The Public Works Manager for Utilities is responsible for coordinating water conservation efforts, including the following:

- Working with the new Community Engagement Manager to educate residents.
- Tracking/logging conservation practices in place throughout the city, where feasible.
- Acting as a point of contact for members of the community regarding general inquiries and information requests.
- Promoting water conservation issues to senior City management officials.
- Preparing the annual water conservation budget.

9.2 IMPLEMENTATION OF DEMAND MANAGEMENT MEASURES, PAST FIVE YEARS

The narrative in Section 9.1 above provides both the nature and extent of the DMMs implemented over the last five years. As required by the 2020 UWMP Guidebook, a summary of the quantification (extent) of the DMMs is provided in Table 9-1.

TABLE 9-1: EXTENT OF DEMAND MANAGEMENT MEASURES — QUANTIFICATION

DEMAND MANAGEMENT MEASURE	QUANTIFICATION
Water Waste Prevention Ordinances	In place since 1993
Metering – All Service Connections Except Fire Have Dedicated Meter	All service connections are metered except fire
Metering – Upgrade to Badger Meters	256 installed in 2020
Conservation Pricing for Single Family Residential	Tier 1: 0 to 7 hcf Tier 2: 7.01 to 23 hcf Tier 3: Greater than 23 hcf
Public Education and Outreach	Website: Ongoing Water Bill Notices: Monthly Drought Notices and Door Hangers: As needed (numbers not tracked) Water Awareness Kits
Programs to Assess and Manage Distribution System Real Loss	Water losses < 10%
Water Conservation Program Coordination and Staffing Support	Included in Public Works Manager's duties

9.3 WATER USE OBJECTIVES

California Water Code Section 10609, adopted in 2018, establishes new standards and practices for the following:

- Indoor residential water use
- Outdoor residential water use
- CII water use – commercial water users, industrial water users, institutional water users, and large landscape water users
- Water losses
- Other unique local uses and situations

In Section 10609.4, the Legislature set the water use objectives for indoor residential water use as follows:

- 55 GPCD until 1/1/2025
- <=52.5 GPCD until 1/1/30
- <=50 GPCD thereafter

The code further specifies that:

1. Local urban retail water suppliers should have primary responsibility for meeting standards-based water use targets, and they shall retain the flexibility to develop their water supply portfolios, design and implement water conservation strategies, educate their customers, and enforce their rules.

2. Long-term standards and urban water use objectives should advance the state's goals to mitigate and adapt to climate change.
3. Long-term standards and urban water use objectives should acknowledge the shade, air quality, and heat-island reduction benefits provided to communities by trees through the support of water-efficient irrigation practices that keep trees healthy.

Water use objectives and reporting will begin in 2023. DWR will propose and implement methodologies for tracking and reporting indoor residential water for 2023. The City will prepare for such reporting and is confident that the community's commitment to water conservation and DMMs will ensure that indoor residential water use will meet the legislated water use objectives.

Until DWR determines how indoor use will be calculated in 2023, the City will monitor winter monthly water use closely as an indicator of indoor water use and will review the effectiveness of existing DMMs.

Outdoor water use is lowest in winter months, although ongoing droughts dampen this effect. Total residential water use in the City of Soledad in January and February of 2021 averaged 62.5 GPCD. This includes indoor and outdoor use. This figure is provided for informational purposes only.

10 PLAN ADOPTION AND SUBMITTAL

This chapter provides information required by the California Water Code related to notification of updating, adoption, and submittal of the 2020 UWMP and the WSC Plan to DWR. This chapter also discusses making the plans available for public review and the process of amending the plans, if required.

10.1 Inclusion of All 2020 Data

Data provided in this 2020 UWMP reflects data in calendar years beginning January 1. Data utilized is current through December 31, 2020. This 2020 UWMP serves as an update to the City's 2015 UWMP. The City has prepared the 2020 UWMP Checklist (Appendix A) to confirm that the UWMP addresses the requirements of the California Water Code.

The City currently relies on groundwater to meet 100 percent of the retail demand; therefore, the City does not provide demand projections to a wholesaler. The City works closely with the Salinas Valley Groundwater Basin Manager, Monterey County Water Resources Agency, for projections of groundwater conditions and supply availability to meet projected demands over the next 25 years. This information was used to update the City's UWMP.

10.2 Notice to Cities and Counties – 60-Day Notice

Consistent with Table 2-5, in Chapter 2, Section 2.4, Coordination and Outreach, Table 10-1 lists the cities, county, other agencies, community groups, and the public that the City provided notification to on the update and development of this 2020 UWMP, the 2021 WSC Plan, and the required public hearing.

The 60-day notice letter was sent to the County of Monterey and the cities within the City's service area on December 28, 2020, to inform these agencies that the City was in the process of reviewing its 2015 UWMP and considering changes or amendments needed in the preparation of its 2020 UWMP. The letter also included information that the City was reviewing and updating its WSC Plan concurrently with the UWMP update to meet the new legislative requirements. This letter was required to be sent at least 60 days prior to the public hearing. Copies of the letters are included in Appendix J.

TABLE 10-1: NOTIFICATION TO CITIES AND COUNTIES, OTHER AGENCIES, COMMUNITY GROUPS, AND THE GENERAL PUBLIC

AGENCY	SENT 60-DAY NOTICE LETTER	SENT NOTICE OF PUBLIC HEARING
CITIES		
City of Gonzales	√	√
City of Greenfield	√	√
COUNTY		
County of Monterey	√	√
OTHER AGENCIES AND COMMUNITY GROUPS		
Greater Monterey County Integrated Regional Water Management Program	√	√
Monterey County Water Resources Agency	√	√
Monterey County Water Awareness Committee	√	√
Salinas Valley Basin Groundwater Sustainability Agency	√	√
Soledad Unified School District	√	√
California Dept. of Corrections and Rehabilitation		
Camphora Apartments	√	√
Dole Fresh Vegetables	√	√
Estancia Estates Winery	√	√
Golden State Vintners	√	√
GENERAL PUBLIC		√

10.3 Notice of Public Hearing

The City encouraged community and public interest involvement in the UWMP update through inspection of the Draft UWMP and the Draft WSC Plan and through participation in the public hearing.

Copies of Draft 2020 UWMP and Draft WSC Plan were posted on the City's website (https://cityofsoledad.com/) and at City Hall to make them available for public inspection. The public hearing notifications were published in local newspapers within the City's service area pursuant to Section 6066 of the Government Code.[1] The City also notified the cities and County and other interested parties listed in Table 10-1 of the time and place of the public hearing as required by CWC Section 10642. Copies of the published Notice of Public Hearing are included in Appendix K.

10.4 Public Hearing and UWMP and WSC Plan Adoption

A public hearing was held on July 21, 2021, during a regularly scheduled meeting of the City of Soledad City Council to present the 2020 UWMP and the WSC Plan. A staff report and presentation

[1] Government Code Section 6066 – Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.

preceded the public hearing to review the legislative requirements, planning process, and key elements of each plan. The public hearing was opened, where all comments were recorded, providing residents and other community members in the service area the opportunity to learn and ask questions and provide input and consider the economic impacts of the plans.

Upon close of the public hearing, adoption of the 2020 UWMP and the WSC Plan was considered by the City Council at the same July 21, 2021, meeting. The City Council considered any modifications necessary to the plans in response to public input, then formally adopted the 2020 UWMP and the WSC Plan by resolution. Resolution No. ______ is included in Appendix L.

10.5 Plan Submittal

The City's adopted 2020 UWMP and related DWR standardized submittal data tables (Excel files, Appendix M), along with the WSC Plan, were submitted electronically to DWR through its online Water Use Efficiency data (WUEdata) Portal (https://wuedata.water.ca.gov/). Electronic copies of the 2020 UWMP and the WSC Plan were also provided to the California State Library (a CD was provided), the Cities of Gonzales and Greenfield, the County of Monterey, and other agencies in accordance with the Urban Water Management Planning Act no later than 30 days after adoption.

10.6 Public Availability

The Final 2020 UWMP and WSC Plan were made available for public review on the City's website no later than 30 days after submitting the plans to DWR.[2] The plans can also be viewed by visiting City Hall.

10.7 Amending the Adopted UWMP or WSC Plan

Upon submittal of the 2020 UWMP, DWR will conduct a review of the UWMP utilizing the Checklist in Appendix A. DWR will determine if the UWMP addresses the requirements of the California Water Code, and a letter will be sent to the City.

If DWR determines that necessary corrections are minor and do not require the UWMP to be amended, an Errata Sheet may be prepared and submitted to DWR, then included with the 2020 UWMP. If DWR determines that the necessary corrections require the UWMP to be amended, then the City will make the amendments and follow each of the steps for notification, public hearing, adoption, and submittal for adopting the amended 2020 UWMP.

The City may amend the adopted 2020 UWMP or WSC Plan at any time, although it must follow the same process for notification, public hearing, adoption, and submittal to DWR.

[2] The plans can be found at https://cityofsoledad.com/our-city/city-departments/facilities/water-quality-control/#Urban_Management_Plan_Superceded_Documents.

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